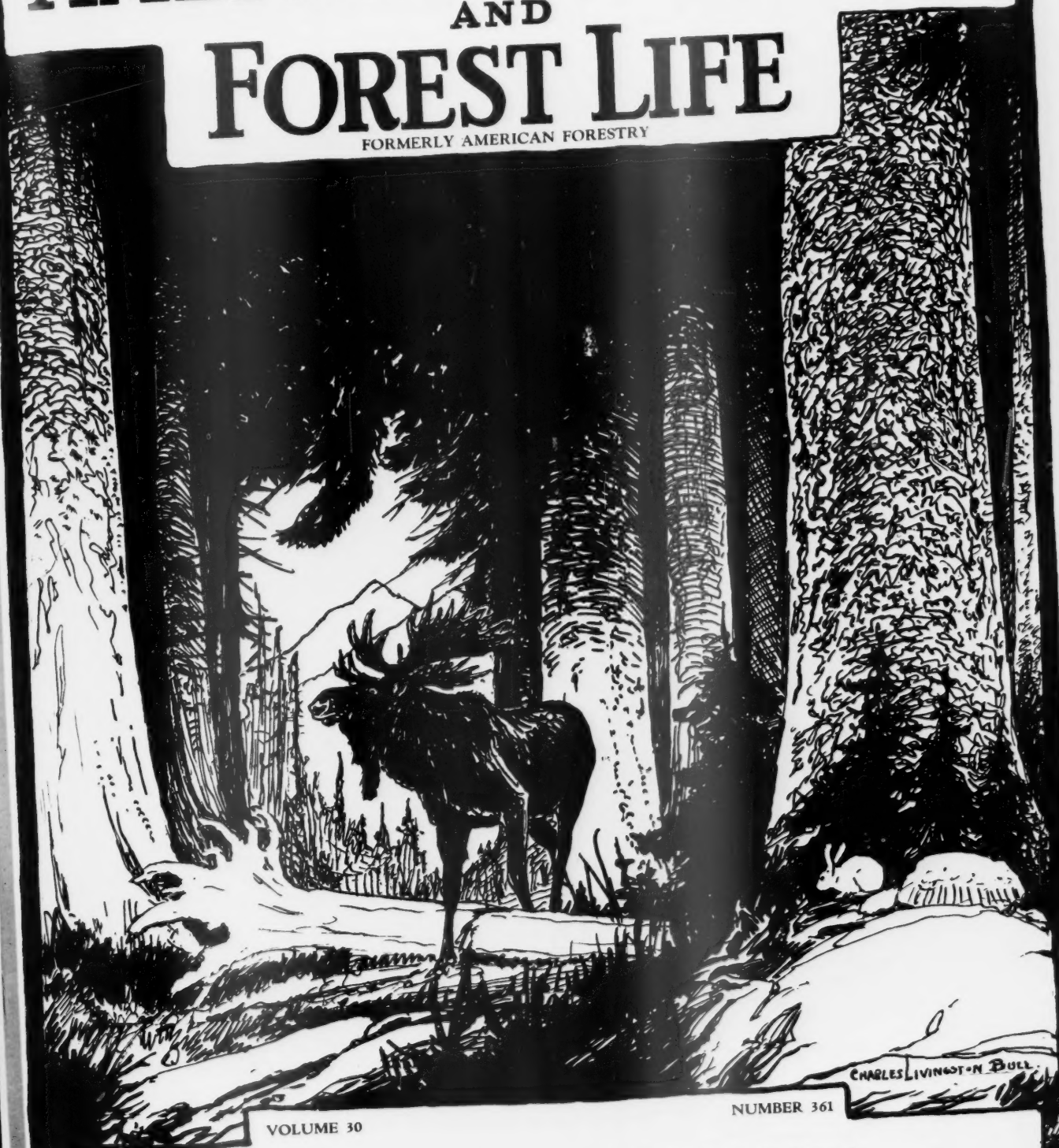


AMERICAN FORESTS AND FOREST LIFE

FORMERLY AMERICAN FORESTRY



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RANGERS OF THE NORTH

AND TWELVE OTHER FEATURES

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JANUARY, 1924

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Washington, D. C.

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The ESTABLISHMENT OF NATIONAL AND STATE FORESTS where local and national interests show them to be desirable; the CONSERVATIVE MANAGEMENT OF PUBLIC AND PRIVATE FORESTS so that they may best serve the permanent needs of our citizens; the development of COMMUNAL FORESTS.

FOREST RECREATION as a growing need in the

social development of the nation and a God-given birth-right of our children; the PROTECTION OF FISH AND GAME and other forms of wild life, under sound game laws; the ESTABLISHMENT OF FEDERAL AND STATE GAME PRESERVES and public shooting grounds; STATE AND NATIONAL PARKS and monuments where needed, to protect and perpetuate forest areas and objects of outstanding value; the conservation of America's WILD FLORA.

The EDUCATION OF THE PUBLIC, especially school children, in respect to our forests and our forest needs; a more aggressive policy of RESEARCH AND EDUCATIONAL EXTENSION in the science of forest production, management, and utilization, by the nation, individual states, and agricultural colleges; reforms in present methods of FOREST TAXATION, to the end that timber may be fairly taxed and the growing of timber crops increased.

AMERICAN FORESTS AND FOREST LIFE

(Formerly American Forestry)

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

OVID M. BUTLER, Editor

WASHINGTON, D. C.

L. M. CROMELIN, Assistant Editor

Vol. 30

JANUARY, 1924

No. 361

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AMERICAN FORESTS AND FOREST LIFE

A New Year and a New Name



WITH this issue the magazine of the American Forestry Association comes to its readers in a new cover and under a new name. "AMERICAN FORESTRY," with its cone-dotted boughs of spruce, remains behind with the old year. "AMERICAN FORESTS AND FOREST LIFE," with its phalanx of mighty trees breathing the vigor of strength and service, goes forward with the new calendar. ¶ ¶ ¶ ¶ ¶ ¶ ¶

As the oak must change its foliage to expand its girth, so all living things must change in order to adjust themselves to growth and to reach the fullness of the years. A change in the name of the magazine has been made by the Board of Directors of the Association after careful and thoughtful consideration. It was finally agreed upon as necessary in order to meet the opportunities for greater service and to broaden the influence and the acquaintanceship both of the magazine and the Association. Under its new name, the magazine will continue to adhere to its present high standard of policy and of character of contents. ¶ ¶ ¶ ¶ ¶ ¶ ¶

Because of its former name, the magazine has too often been considered in the light of a technical publication, whereas its purpose is to carry the popular story of the forests and their service to the American people in all walks of life. To attain success, forestry in America must reach the man on the street, and open his eyes to his personal use of and dependency upon the forest, whether it be for wood or the myriad other forest products, or merely as a place to spend his summer vacation. ¶ ¶ ¶ ¶ ¶ ¶ ¶

A wider and stronger public appreciation of forests in America is the great need of the day, and it is that task which the Association's magazine, under the new banner of "AMERICAN FORESTS AND FOREST LIFE," will undertake in greater measure and with inspired hope. ¶ ¶ ¶ ¶

THE EDITOR

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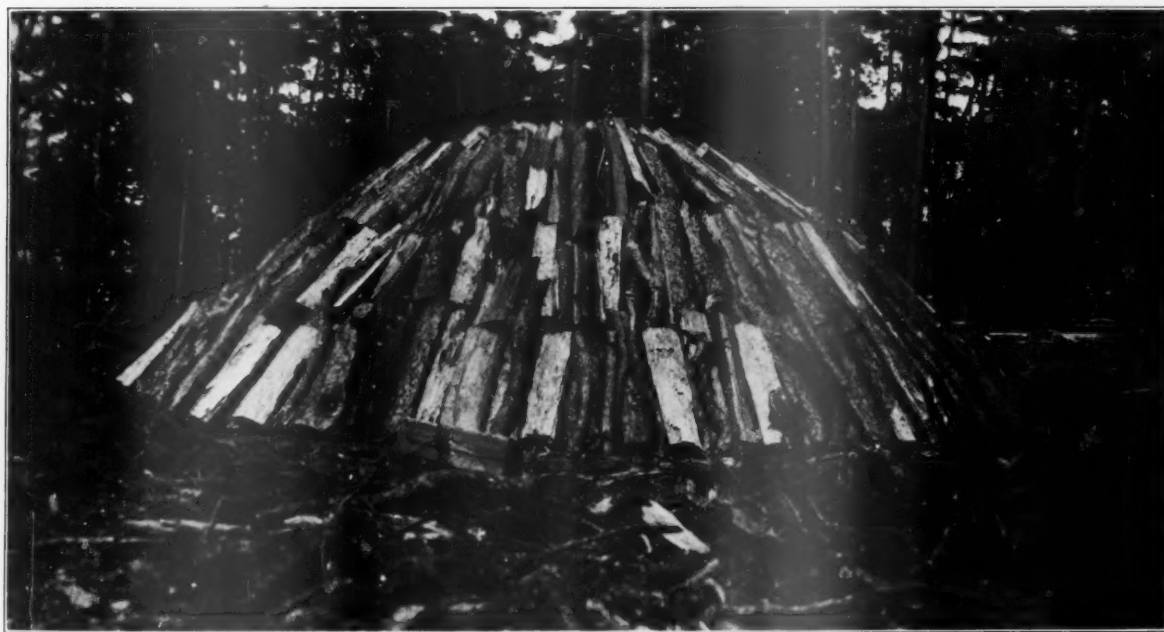
Wonder Burners of Wood

*Powerful of Shoulder and Unkempt of Beard, the Ignorant Charcoal-Maker
Has Been Forced to Draw the Fires from his Forest Hearth and to
Yield to the Miracle Methods of the Modern Chemist*

BY LOUIS E. WISE

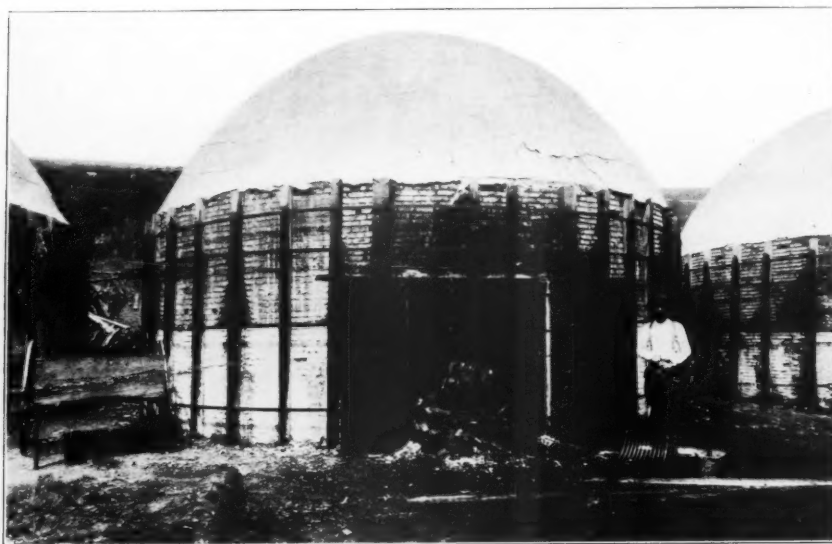
PICTURE, if you will, a virgin forest in Central Europe five hundred years ago. Massive oaks and great birches mingle with the stately silver fir and pine trees, hoary monarchs bearded and encrusted with lichen, feeding on the humus of their decaying ancestors. Then follow through this gnarled forest the furtive movements of a grimy, stooping little man, with powerful shoulders and unkempt beard—a veritable gnome of the Urwald. Shadow him stealthily, for he is a shy creature, this forest manikin. He carries with him a great secret. He is the “coallier”—the producer of charcoal from wood.

Watch him as he clears a site in the heart of the forest, felling birches and pines, clearing out the brush, and carefully leveling his “hearth.” Spy on him, as in the center of this clearing he erects a thick pole, or perchance a fagot, and around this groups his well-trimmed billets of wood. Layer upon layer he stacks them, until he has formed a great circular mound half a hundred feet in diameter at its base and perhaps ten feet or more in height. Thus he builds his “meiler,” which he covers with brush and turf, so as to exclude air, except for occasional vents, so that some air has access to the wood. Then he withdraws his central pole or his fagot, leaving a chimney in which he



Courtesy of the Great Southern Lumber Company

A MODERN RECONSTRUCTION OF THE CHARCOAL-MAKING METHODS USED BY THE OLD COALLIERS, WHO
PLIED THEIR ART IN THE HEART OF THE FOREST AND ALL UNKNOWINGLY LOST THEIR MOST VALUABLE
PRODUCTS IN SMOKE



Courtesy of the Forest Products Laboratory

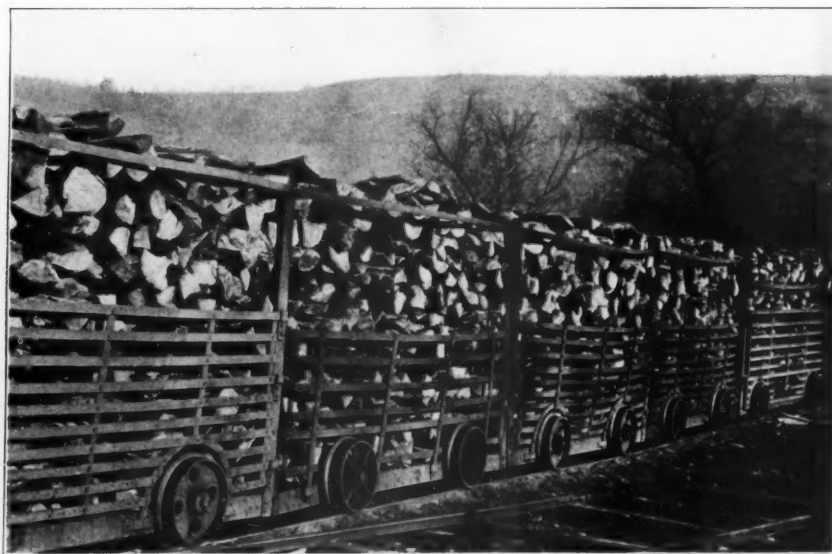
MORE MODERN METHODS CARRIED THE WOOD TO A CENTRAL POINT, WHERE THE COALING PROCESS WAS CONDUCTED IN BRICK-KILNS

lights his fire. Now, if you have sufficient patience, you can share the coalier's long vigil. He watches his *meiler* with the eye of an expert. By closing some air vents at the base of his mound and by opening others, he directs his coaling process, so that the fire spreads evenly throughout the mass and burns slowly, with the minimum consumption of wood. Only sufficient air is admitted to permit thorough charring, and finally all air vents are closed. Then the hawk-eyed coalier watches the color of the gases as they escape from the cracks in his *meiler*. When they have turned pale blue, he gradually removes sections of the outer turf and quickly douses his fire. It is a ticklish

as great secrets to his eldest son—and no doubt defends them with his very life!

If the old coalier had Methusaleh's span of life and walked this earth today, he might tell of the strange evolution of his little industry. No doubt he would still find his primitive coaling methods in vogue in some parts of Europe; but if he traveled to the North American continent, he would be dazed by the modifications in charcoal-making wrought by the chemist.

For the chemist was dominated by *ideas*, not by hereditary secret processes.



Courtesy of Nelson C. Brown

MATERIAL FROM THE FOREST, LOADED ON STEEL "BUGGIES," EN ROUTE TO A MODERN OVEN, WHERE THE CHEMIST GATHERS WEALTH FROM WOOD AND SMOKE

business, one which requires constant attention and not a little skill. A misstep will lower his yield; premature quenching will give him a lower quality of charcoal. Days, often weeks, elapse before his charge is fully coaled. It is a tedious process and one which from our modern viewpoint is criminally wasteful; *for the coalier, in obtaining his charcoal, burns or wastes the most valuable part of his wood.* He consumes or sends out into the atmosphere those unbearable tear-producing vapors which bulk so large in our wood-distillation industry of today. Untold wealth goes up in smoke! Yet the old coalier is very proud of the fine points and technical niceties of his wood-coaling. In the depths of the Urwald he imparts them

He realized that the by-products that were lost in the old coaling process were valuable commercially, so he set out to develop methods that would insure their recovery. The chemist had the patience of the coalier, but he was also blessed with an open mind. He was willing to experiment. With the aid of the engineer, he worked with kilns of various types—with cylindrical retorts, and finally with the present-day distillation ovens—until he was satisfied with the efficiency of his recovery methods. This statement really needs modification. The chemist is *never* satisfied; he is continually on the alert, and there are numerous indications that the wood-distillation industry is still undergoing radical transformations.

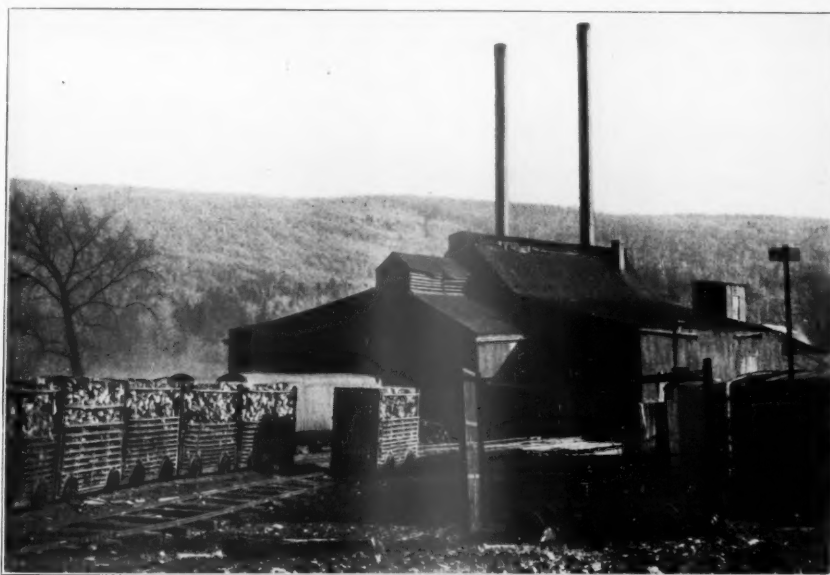
Today, in some of our modern distillation plants, hardwoods like

beech, birch, and maple are carefully seasoned and dried, cut into blocks, and loaded through hoppers into skeleton steel cars, which are then run on narrow-gauge tracks into steel ovens equipped with nozzles which are in turn connected with suitable condensers. By the use of furnaces under these ovens, the wood is converted into a high grade of charcoal in about twenty-four hours. (Contrast this with those weeks of watchful waiting of our friend the coal-lie!) The cars are then withdrawn and run successively into two metal "coolers," and at the end of two days the charcoal can be exposed to air. After another day or two it is ready for shipment and consumption.

However, charcoal manufacture is not a chemist's only concern. The products which the coal-lie lost fascinate him far more, and the study of those products, which issue as vapor and gas from the nozzles of his ovens, have led to the modern hardwood distillation industry. The principal materials obtained in the chemical changes wrought by carbonization (with the exception of charcoal) are "wood gas," "pyroligneous acid," and tar. The two latter occur as vapors, which are condensed to liquids and subsequently refined.

The wood gas has sufficient heating value to warrant its use as fuel under the boilers or ovens of the plant. In other words, the plant supplies part of its own fuel. In some heavily wooded countries, where coal is rather scarce, wood gas is deliberately manufactured and, in admixture with coal gas, finds application in heating and lighting.

Pyroligneous acid is a very complex watery mixture that contains the highly prized wood-distillation products. From it are prepared acetate of lime and the well-known wood alcohol, both of which now serve as raw materials in numberless industries and both of which played so great a rôle in the European war. In the year following the war, wood distillers in this country manufactured 169 million pounds of acetate of lime and 9 million gallons of methanol (which is the



Courtesy of Nelson C. Brown

THE PRIMITIVE COALING METHODS OF THE STOOPING MEN OF THE URWALD ARE STILL IN VOGUE IN PARTS OF EUROPE, BUT IN AMERICA THE CHEMIST HAS TRANSFORMED THEM BY THE HAND OF SCIENCE

alias adopted by wood alcohol since the eighteenth amendment came into being).

During the war acetate of lime assumed unusual economic importance. It formed the chief source from which acetone was produced, and acetone was widely used in the manufacture of the explosive cordite, and of the poison gas "bromoacetone." Furthermore, acetone had other well-established industrial uses which encouraged its production, as well as that of its precursor. It is a remarkable solvent; it is used in the manufacture of chloroform and



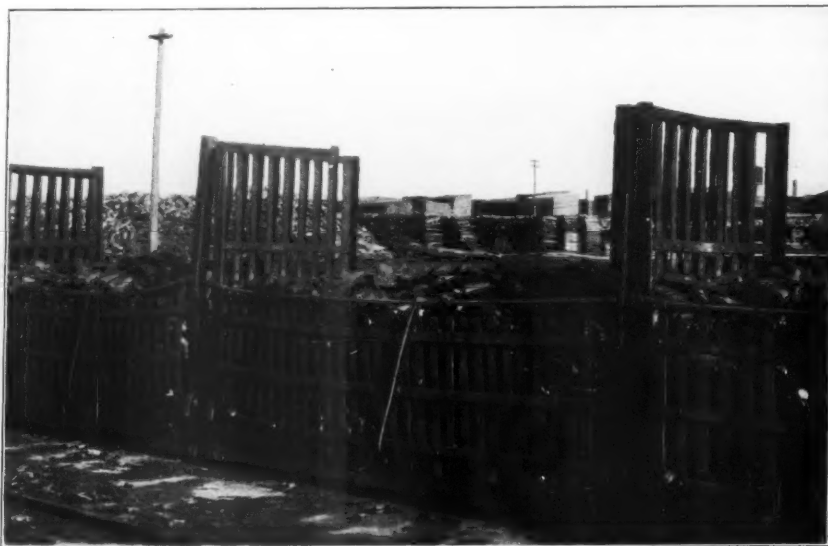
Courtesy of Nelson C. Brown

IF SOME OF THE OLD COALLIERS COULD WALK THE EARTH TODAY, THEY WOULD TELL STRANGE STORIES OF THEIR LITTLE INDUSTRY AND SHAKE THEIR HEADS SADLY AT THESE MASSIVE CHARCOAL COOLERS

iodoform and in the sleep-producing drug sulfonal. It is valuable and indispensable in the storage of acetylene. Besides, it finds application in the manufacture of the vat-dye indigo.

Acetic acid is another versatile product derived from acetate of lime. The fact that it could be obtained from wood was known by certain learned alchemists in the time of the medieval coallier, but its production from this source was not exploited until the 19th century. The purified acid and its derivatives are used in the manufacture of innumerable synthetic drugs, of which acetanilide and aspirin are known to every household. The acid is further employed in the production of various salts, pigments, dyestuffs, perfumes, and solvents, as well as in the manufacture of the most recent form of artificial silk. It serves as a raw material for the manufacture of "dope" (the surface coating) of airplane wings and of non-inflammable photographic films. In fact, acetic acid is one of the keynotes of the organic chemical industry. Without its production on a large scale, numerous enterprises would never have seen the light of day.

In making the acquaintance of wood alcohol (alias methanol), it is well for the layman to forget his prejudices. This compound, so deadly when misapplied, has been the friend of the industrialist, the physician, and the farmer. The fact that it has also served the bootlegger is naturally to be keenly regretted. Itself a splendid solvent, methanol has been transformed into a powerful army of useful substances, of which formaldehyde holds high rank. This compound, in the form of its water solution, "formalin," is a powerful germicide and disinfectant and is used in hospitals, zoölogical gardens, and undertaking establishments. Besides these lugubrious uses, formaldehyde has been exploited in the production of synthetic resins (like condensite and bakelite), which form



Courtesy of Nelson C. Brown

CHARCOAL FROM A MODERN OVEN. IT IS ONE OF THE LEAST VALUABLE PRODUCTS WHICH THE CHEMIST RECOVERS FROM THE OLD COALLIER'S WASTEFUL HEARTH

the substance of brush handles, radio outfits, billiard balls, pipe-stems, and insulators. Its extreme reactivity permits its use in the formation of certain synthetic dyestuffs, in tanning of sole leather, and in the production of some very useful drugs. Besides being a germicide, formaldehyde is a powerful fungicide, and as

such has proved a boon to the growers of potatoes and wheat.

Although it is possible for the chemist to make formaldehyde from sources other than methanol, it never pays him to do it; and so wood alcohol, which causes blindness and death when misapplied and taken internally, has proved of inestimable service to mankind when properly utilized.

The wood tars and oils have no such wide acquaintance with the industries as have their colleagues, acetic acid and methanol. In some plants they are used in part as supplementary fuel. Nevertheless, they have found some markets, and their utilization in the form of flotation oils (used in the separation of ores), as stains and preservatives, and more especially in the production of the medicinals creosote and guaiacol, is noteworthy.

Most of these wood products, which have entered the very life blood of modern industry, in peace and war alike, would be commercial nonentities if the crude methods of the old coalliers still obtained. Acetic acid and wood alcohol would still be lost in the gases of the "meiler," with the little charcoal-maker standing by in blissful ignorance of his tremendous loss.

EDITOR'S NOTE.—This is the first of a series of interesting articles by Mr. Wise dealing with the marvelous changes which the modern chemist has wrought in the utilization of products from our forests.



The Story of Our Christmas Nuts

Wherein We Are Taken Back to the Days of Cave Men, Penetrate the South Seas, and End Happily in Our Own Sunny Southland

By W. C. DEMING

AFTER the goose and onions, apple sauce, mince pie, and cider of an American's Christmas dinner come the nuts and raisins, associated symbols of joy and plenty. Do we ever stop to think of the story of our Christmas nuts—whence they come, how they are grown and gathered? Let us take them as they rise to the top of the big bowl and consider their story.

First in sight, and to most of us first in mind when anybody says "nuts," is the fat aristocrat, the English walnut. But not always was it an aristocrat. Away back in time, when man dwelt in cave homes, the ancestor of the nuts we now call English, growing wild in central Asian glades, was small, thick-shelled, and hard to crack. We find them now like that in seedling trees gone back to ancient ways. But one tree in a thousand bore nuts that were larger, thinner-shelled, and sweeter than the rest. The cave man's

pickaninnies knew this tree and planted some of the nuts near the cave. Among the trees that resulted was one that bore nuts a little better still. These, too, were chosen and planted, and thus began a process of selection by man that, acting through century after century, has resulted in the big, thin-shelled nut we call the English walnut.

But its pre-eminence is not undisputed, and even the right to its Christian name is denied by horticultural purists, who say it should be Persian rather than English. That's because it grew in Persia thousands of years be-

fore it did in England. Among themselves, the learned call it *Juglans regia*, the royal nut of Jove. The name testifies to its estimation and antiquity. Madeira nut is another name, and Circassian walnut is its woody tree trunk served up as furniture.

We do not get these nuts now from Persia. Scattered first, perhaps, by royal favor, and then by every man, wherever in those days man lived on earth, the Persian wal-

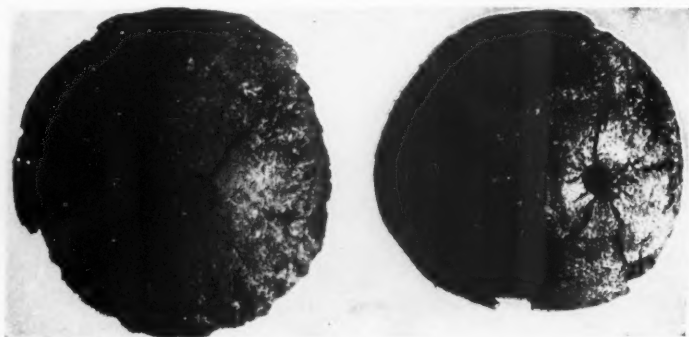
nut thrived in places all about the Mediterranean Sea, for example; and still most of our walnuts come from Italy and southern France. But California's climate is like that of the Mediterranean, and here American methods have developed great orchards of grafted trees grown under irrigation, where the nuts are systematically harvested, dried, cleaned, graded, packed, and sold by a great co-operative organization a model for commercial horticultural-



THAT FAT ARISTOCRAT, THE ENGLISH WALNUT

Coming originally from the glades of Persia, whence its true name—the Persian Walnut—this large, rich, and toothsome nut is the result of thousands of years of evolution, for it was in the beginning small, hard-shelled, and hard to crack.

tourists. To be sure, they bleach the nuts a little with sulphur, which to some eyes gives them a color inferior to the natural gold of the untreated nut. Imported nuts are not bleached, but they also are not graded, and they sell for lower prices than the California nuts; yet experts declare that the nuts from the Grenoble district of France are of finer quality. China and Chile send us usually inferior nuts, some of them still in the cave-man stage of evolution. Picked green, when you can run your hatpin through husk and nut and all, and pickled with elaborate detail, the Englishman raves about



Courtesy of the Pan American Union

PYXIDIA OF BRAZIL NUTS

The trees grow to a height of 100 feet or over, and the pyxidium, being a shell 7 inches in diameter loaded with nuts, would easily crush a human skull were it to fall on it from such a height.

them, but in America we seldom see them. It is said you can treat the black walnut and the butternut, when green, in the same way with equally good results.



Courtesy of the Tea and Coffee Trade Journal and the Pan American Union

THE BRAZIL NUT (CASTANHA) TREE

A native of Brazil and one of the most important exports from that country, the rich nuts, sometimes called cream nuts, are greatly in demand during the holiday season.

Any of us can grow a Persian walnut tree and get good nuts from it, if we have a free spot of ground thirty by thirty feet that isn't frozen up more than four months of the year, if we will get a grafted tree from a non-grafting nurseryman and give it loving and intelligent care. But commercial production in the East is not yet established.

Sticking up their black, triangular "nigger toes" between the blue-blooded Persian walnuts are the Brazil nuts, called so, wonderful to tell, because they do come from Brazil.



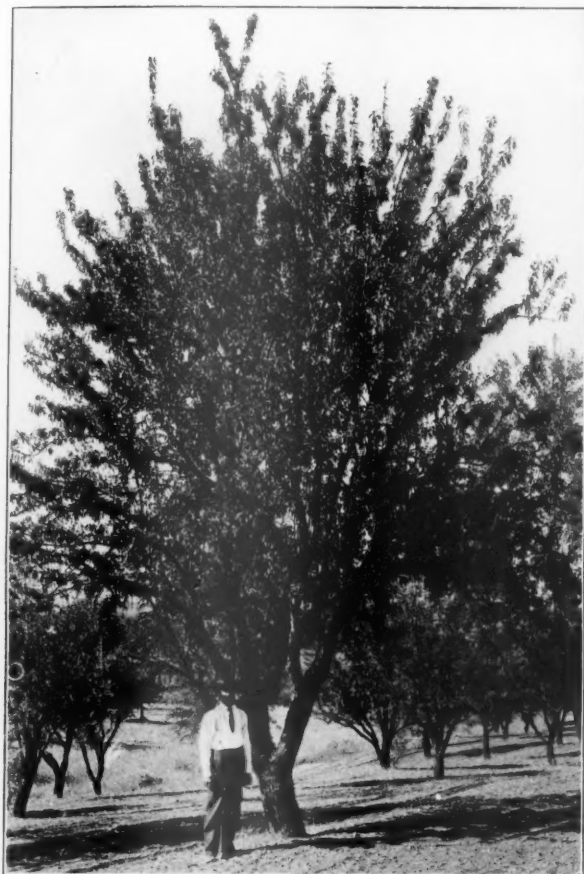
Courtesy of the Botanical Gazette and the Pan American Union

THE OPEN SHELL

The pyxidium has been cut to show its structure and the position of the nuts within it.

They grow packed together in big black cases like cannon balls, and tales are told of how the monkeys throw them down on the devoted heads of unwary passers-by. Here's a chance to trade in South America with surplus war helmets. The natives gather the nuts, and they are shipped down the Amazon and other rivers for export. Like the Brazil nut, but not so often seen, is the Sapucaia, or Paradise nut, that grows in six-inch, urn-shaped pots, called monkey pots, because when ripe they open with a sharp clack, or trap rock, to let the monkeys know the nuts are ripe and falling, so some travelers say. A thoroughly reliable South Sea excursionist should verify this. Perhaps he would find a way to grow monkey pots and monkeys on the Hackensack. Brazil nuts have a way of turning to powder in their shells when kept too long. I once bought a marvelously cheap pound of a peddler in the street and every one was dust within.

Almonds are favorites at Christmas. Blanched



AN ALMOND GROVE IN CALIFORNIA

Formerly our almonds all came from Mediterranean countries, but now they are coming more and more from California, where their culture has grown to be an important industry.

and salted, they make good nibbling between courses. In the bowl we find the soft-shelled almonds, but the best kernels for blanching come from the hard-shelled Jordans. Following the rule that nuts are named from "where they don't come," the valley of the Jordan River is not the source of the almonds of commerce. Some say the name is a corruption of the French "jardin," which I expect is the truth. The almond is first cousin to the peach. It is, in fact, a peach stone with a green skin, no flesh, and a sweet kernel. The bitter almond, however, has a kernel like that of the peach stone, and both are poisonous on account of the prussic acid they contain. In China they use a sweet-kerneled apricot as we do the almond.

Almonds are propagated by budding them on peach stocks or little peach trees. Formerly our almonds all came from Mediterranean countries, but now more and more are coming from California, where their culture is getting to be an important industry. As with the Persian walnut, by superior curing, grading, and packing, American methods produce the more attractive nuts. In California the nuts are harvested by spreading a large canvas sheet under a tree, shaking down the nuts, and then dragging it from tree to tree with a horse until it

is loaded. Husking, drying, bleaching, grading, and packing are then finished by machinery. Methods of marketing, too, are machine-like in their efficiency and bring the natural reward of better prices to the growers.

In Europe the green almond is a favorite dessert delicacy. They are picked green, after the milk stage, and cracked at table. I have eaten them thus from my own tree the second summer after putting almond buds in a peach tree. This was a hard-shelled almond, the Ridenhauer, that does quite well in New England. The soft-shelled almond is too tender in wood, too early-blooming, to stand the climate. I have seen almonds that are said to grow wild in the Middle West. In full bloom, no leaves yet showing, an almond orchard is a lovely sight in the spring, but not one whit lovelier, I fancy, than one of our New England peach orchards on a rolling hill of glacial drift. Some day a follower of Van



THE FILBERT AND ITS FRUIT

Though most of our filberts come from the Old World, their cultivation is becoming more general in America, for we can grow them just as well. The name filbert is derived from "vollbart," or "fullbeard," inspired by the shaggy husks which cover the sweet kernels.



Courtesy of the Summit Nurseries

THE PECAN, KING OF NATIVE AMERICAN NUTS

What it took the Old World thirty centuries to do with the Persian walnut the New World has done in thirty years with the pecan, and the result is this great, rich, thin-shelled, fine-flavored nut.

Fleet will cross the Ridenhauer, or the native western almond, with the soft-shell Nonpareil and get a hardy, late-blooming, soft-shelled nut that will grow wherever the peach does. What a wonderful chance for the man of wealth, leisure, and still plastic brain—if such there be!

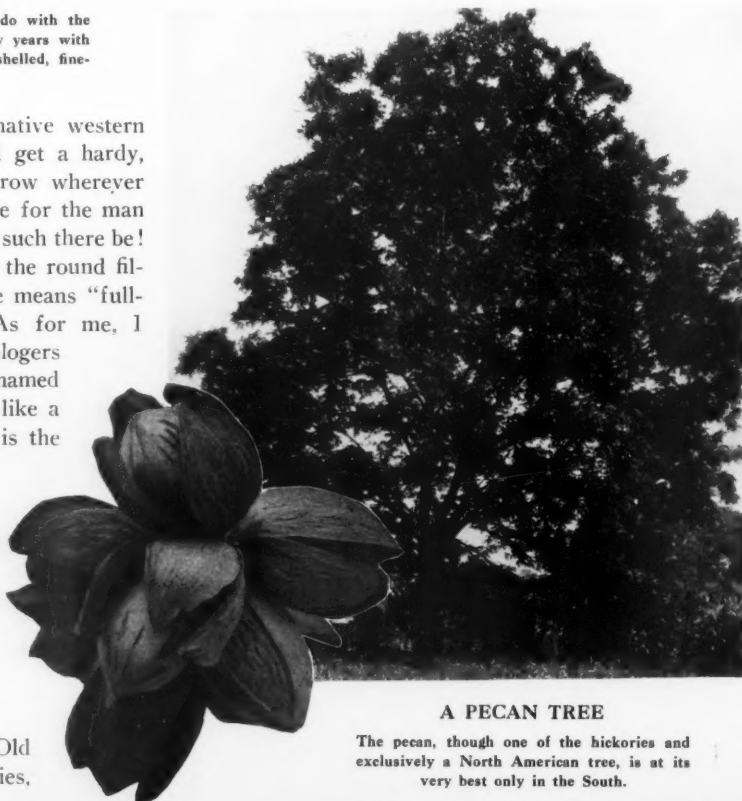
Rolling about among the other nuts are the round filberts. Who would dream that their name means "full-beard," from the German "vollbart"? As for me, I don't believe it; but the fancy-free philologists like to say such things. They say it is named from the long-fringed involucre, or husk, like a beard that some varieties have. *Corylus* is the Latin name, and doesn't it sound pastoral and poetic? A good name for the first boy or, feminized, even good enough for a girl, *Coryla*—accent on the first syllable. *Corylus colurna*, *Corylus avellana*, the filbert is fortunate in its family names. Hazel we call our American form of the filbert; and that, too, is a good name. They say it comes from the Anglo-Saxon "haesel," hood or bonnet.

Almost all of the filberts come from the Old World, where it grows in many countries,

abundantly even in England and Germany. Harvesting and marketing are simple. They just pick them up, dry them, and dump them into ships in bags. We can grow the filbert in America, and probably quite as well; but when they were first tried a discouraging thing happened. Just as the bushes were beginning to bear good crops, a blight with a terrible name, *Cryptosporella anomala*, swept them away. To our native hazels, accustomed to it for ages, it was nothing more than a light attack of chickenpox. Now we know how to combat it. Beautiful filberts are grown in an orchard near Rochester, New York, and in the North Pacific States it is beginning to be grown commercially. If you wish to grow them, you must have several varieties, so that they will pollinate one another, as the varieties are almost always self-sterile. You must learn also how to combat the blight.

But what is this little red bullet that bobs around in the bottom of the bowl and is shunned by every one? Ah, I see that you don't know nuts and have been buying them "mixed." Those are the little wild, red-earth-polished, Texas pecans that the dealer puts in as fillers, along with some of last year's powdery Brazil nuts, Chinese and Chilean walnuts, and hard-shelled almonds, so as to sell at a lower price. If you must economize, buy fewer nuts and those of named varieties. You get more for your money. South of Mason and Dixon's line, they are p'kahns; north of it, pecans.

The pecan now disputes the throne of the Persian walnut. Certainly it is king of native American nuts. Yet but thirty years ago about all that ever got to market



A PECAN TREE

The pecan, though one of the hickories and exclusively a North American tree, is at its very best only in the South.

[Continued on page 55]



Photograph by courtesy of American Museum of Natural History, N. Y.

THE WHIPPOORWILL HIDES ITS NEST BY NOT BUILDING ANY

It lays its eggs on the ground in the woods, where they are perfectly concealed by their likeness to their surroundings. The bird, too, matches the leaves perfectly.

Hidden Homes in Forest and Field

BY LAURENCE H. SNYDER

ON a day's ramble through the fields or woods it is possible to pass dozens of homes—homes of birds, mammals, or insects—and not see more than a very small per cent of them, even with sharp eyes and careful watching. Many of Nature's creatures are adepts at concealing their homes. Of course, we are familiar in a general way with this. We think of all bird's nests as hidden. We think of the thick screen of leaves as hiding homes of all sorts, and perhaps we think that in the midst of deep foliage a home would naturally be more or less concealed. That is so, of course. But in some of the interesting special cases a particularly clever means of concealment is used.

Although all birds hide their nests more or less, some seem to take especial pains to do so. The meadow-lark, which builds on the ground, in the midst of a field, arches its nest over with grass, so that it is invisible from above, and can only be seen from close to the ground, and then only from directly in front. Moreover, the bird does not rise directly

from the nest, but runs a little way along the ground before flying, so as not to betray the spot. The meadow-lark is the only field-nesting bird which habitually conceals its nest in this manner.

The oven-bird uses a like method on the ground in the woods, covering its nest with dead leaves, so that it is one of the hardest of all nests to find. Other nests are occasionally concealed in this way, but these two are outstanding.

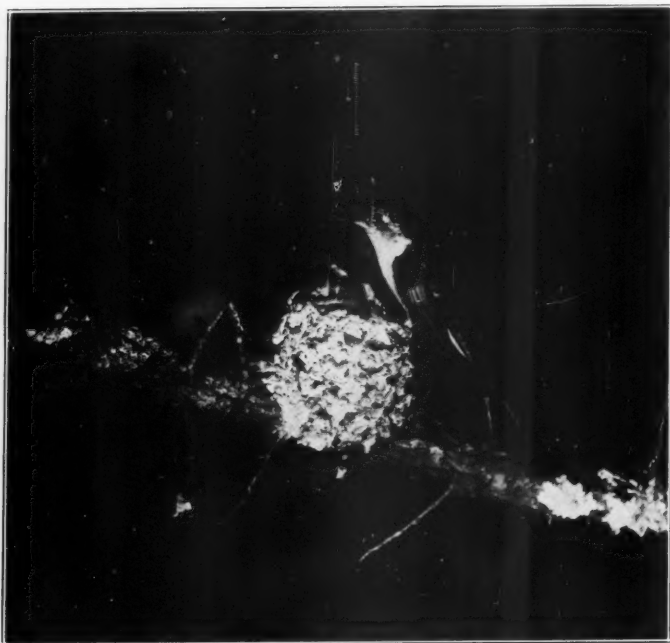
The humming-bird saddles its tiny nest to a branch, and, though no leaves may hide it, it is all but invisible. The outside is covered with small pieces of lichen, fastened with spider web or plant fibers, so that the nest, which only measures about an inch across, looks exactly like a bump or excrescence on the branch. Whether or not the humming-bird purposely uses the lichen for concealment is an interesting question, but the nest could not be better concealed. It is a strange thing that of about four hundred known species of humming-birds, only one visits eastern North America.



Photograph courtesy Dr. John Henry Comstock

THE TRAP-DOOR SPIDER

Who covers the entrance to its burrow with a hinged trap-door. When this is closed the home is practically invisible.



Photograph by courtesy of Edward H. Forbush

THE HOME OF THE DAINTY HUMMING-BIRD

The humming-bird's nest is covered with lichens, so that it looks for all the world like a natural excrescence on the branch

The wood-peewee and several of the flycatchers use a similar means of concealment, saddling their nests carefully to bare branches.

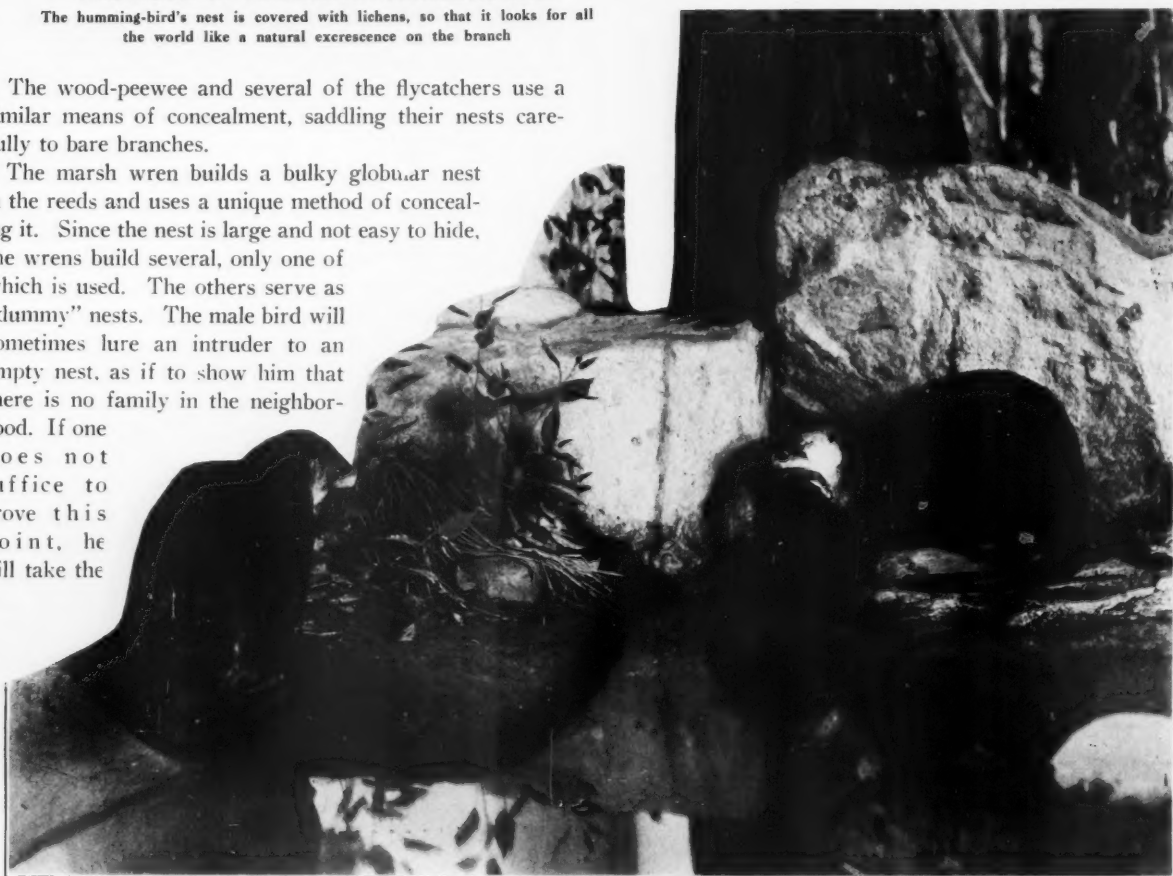
The marsh wren builds a bulky globular nest in the reeds and uses a unique method of concealing it. Since the nest is large and not easy to hide, the wrens build several, only one of which is used. The others serve as "dummy" nests. The male bird will sometimes lure an intruder to an empty nest, as if to show him that there is no family in the neighborhood. If one does not suffice to prove this point, he will take the

intruder to another empty one. Whether done on purpose or not, this serves as an excellent means of protection for the sitting female.

There are birds which build no nest at all, but whose homes are concealed by the fact that the eggs closely match their surroundings. The killdeer nests on the bare ground, yet its home is not easy to find. The nighthawk lays its eggs on the ground, on a flat rock, or a gravel roof, and they match their background so well as to be nearly invisible. The whippoorwill lays its eggs on the ground in the deep woods, where both the bird and the eggs match their surroundings to perfection.

Some birds of other countries offer interesting examples of skill in concealment. The hornbill female nests in a hole in a tree, and during incubation the male imprisons her by sealing up the entrance with mud. Only a small opening is left, through which he supplies her with food. The tailor-bird sews the edges of a large growing leaf around the nest, completely concealing the home from view.

Some of the burrowing animals take especial



Photograph by courtesy of American Museum of Natural History, N. Y.

PROTECTED BY WATER IS THE OTTER'S FRONT DOOR

As much at home in the water as the fish it lives on, the otter cleverly conceals the entrance to his burrow by making it under water, along the bank of a stream.

care to hide the entrance of the burrow. Since a pile of dirt would give away the location, it is frequently removed. Chipmunks sometimes carry the dirt considerable distances

around the nest, the spider will bring moss across the bare ground and cover the trap-door again; so that now, instead of being hidden, the door is the most conspicuous object in sight.

Some small crustaceans build tubular nests among seaweed. These are spun of a weblike material, and frequently bits of seaweed are used in building. This, of course, makes an effective means of concealment.



Photograph by courtesy of American Museum of Natural History, N. Y.

THE HORNBILL FEMALE NESTS IN A HOLE IN A TREE

The male seals up the entrance during incubation, leaving only a small hole through which he supplies her with food.

away, in the cheek pouches. Another way is to dig down, piling up all the dirt at the beginning of the excavation, and keep digging up again to a new spot, which, being dug from below, will not have a pile of dirt to mark its location. The old entrance may then be filled up and abandoned.

The otter makes its home in a burrow in the bank along the edges of a stream, the entrance usually hidden by being under water, for the otter is as much at home in the water as the fish it lives on.

Among the lower forms are occasionally found extremely clever means of hiding homes. The trap-door spider makes tubular burrows under the surface of the ground, covering the entrance with a hinged trap-door. When the spider enters its home and closes the door after it, the entrance is practically invisible. In the places where these spiders nest, the ground around the hole is carpeted with moss; so the spider covers the trap-door with moss, too. This is not as intelligent an act as it looks, for if the moss is removed from the door and also from the ground



Photograph by Laurence H. Snyder

THE CAMOUFLAGE OF THE MARSH WREN

The marsh wren's nest is too bulky to be easily hidden, so the wren builds several of them, only one of which is used. The wren will lead you through the swamp, away from the right nest, to one of the "dummy" ones.

And so it is seen that, while nearly all nests and lairs are in a general way more or less hidden from view, some animals use particularly clever methods of "fooling the public" by concealing their homes and protecting their families.

An Insect Carpenter

An interesting worker in wood is the carpenter bee. This bee will make burrows in rather hard wood and in the bottom of the hole lay an egg. After placing some honey and pollen by the egg, it builds a partition and lays another egg, and so on until the burrow is filled. A large number of pairs of bees will occupy the same stump or post.—*Yosemite Nature Notes*.

From My Indian Diary

*Having to Do with an American Forester,
the Bengal Jungles, and Wild Elephants*

BY CARROLL V. SWEET

WE WERE enjoying our afternoon tea on the veranda of a forest bungalow in the jungles of Bengal and discussing the affairs of the outside world. Subconsciously I was trying to adjust myself to the point of view of my host, an Oxford graduate in forestry and Deputy Conservator of Forests in His Majesty's service, who talked of strange subjects—the Chelmsford reforms and non-cooperation, the effects of black-water fever, American logging machinery, and the condition of the tea market.

My host had just finished telling of the rampages of a rogue tusker that had been making a nuisance of himself

skill the catch had been made possible, and 25 per cent to the credit of the division. This, with the other two catches which the *shikari* had made during the year, would net the division more revenue than his departmental thinning and fellings.

Early the next morning we started on elephants to the stockade, back in the hills twenty miles away. The exhilaration of rolling along through heavy forest undergrowth ten feet above its entanglements and the possibility of seeing a tiger or stray rhino added a thrill to the cool freshness of the January morning and the sweetness of the after-breakfast pipe. After an hour's travel across country through the heavy *sal* forest, we came out on a bullock-cart road which led over a crude wooden bridge to the main highway, at the edge of the forest. As my elephant approached the bridge he stopped and, putting one front foot on the bridge, tapped it gently, to estimate whether or not it was strong enough to carry his weight. Deciding that he did not care to risk it, he turned aside and cautiously forded the stream, while the mahout shrugged his shoulders resignedly and explained in his jungle dialect that a good elephant never could be made to cross anything which would not bear his weight. There is surely nothing human in the appearance of an elephant, but his intelligence and behavior are often uncanny.

From the highway we had our first glimpse of the real character of the country through which we had to pass. For mile after mile we could see nothing but tea, tea,



PRISONERS FROM THE JUNGLES

"Suddenly we were confronted by twelve gray bulks separated from us by a frail-looking palisade of saplings lashed together by cane and creepers."

of late by coming out of the jungle on the road to charge the native bullock carts and make off with their loads of rice, when word came by runner that a herd of twelve wild elephants had been rounded up and driven into a stockade on the edge of the division. I was as excited as any Westerner would be at the prospect of seeing a catch of wild elephants and was ready to travel all night, if necessary, to reach the stockade at once.

But my host had seen wild elephants before and was more interested in figuring out the amount of revenue that this round-up would mean to his division. The market for sound working elephants was good. If there were not too many calves in the herd, they should bring at auction an average of 3,000 rupees apiece, delivered at the foot of the hills. Fifty per cent must go to the government, 25 per cent to the head *shikari*, by whose



HEADQUARTERS

A forest bungalow for the use of the forest officers on tour in Bengal. The living quarters are upstairs—as far away as possible from the dampness and malarial mosquitoes.



ARE THERE GOOD ROADS IN INDIA?

There are thousands of miles of highway as good as this, and such avenues of beautiful shade trees as can be found in few countries. Law provides that all public highways shall be planted with suitable shade trees.

tea—closely cropped and squarely trimmed bushes in straight rows three feet apart, growing in the light shade of feather-foliaged acacia trees. The evidence of the intensive cultivation of the tea bushes and the delicacy of the purple-tinged acacia trees overshadowing them contrasted strikingly with the ruggedness of the Himalayas, which rose abruptly from the plains in the background. It seemed congruous enough to be riding elephants through such country, but highly improbable to me that within fifteen miles we should see a herd of wild elephants in their natural surroundings.

We headed through the tea gardens for a deep cut in the hills and rode until noon up what, in the West, we call a "canyon." The bed of the canyon, or *nulla*, was thickly grown with fine trees of strange nomenclature, but which might have been ash, or elm, or gum, judging from their gross characteristics and appearance.

At intervals we passed typical Himalayan lumber camps, consisting of two or three Chinese-looking Indians, who were felling or had felled a tree, butt foremost, down the steep slope into the bottom. There, supported at one end, three or four feet above the ground, it was being converted inch by inch into clean, well-manufactured boards by means of a double-handled rip-saw of antique design—one sawyer standing upright on the log and the other squatting on the ground underneath. The day's cut consists of but a few boards, but it is by such methods that much of the timber of India is converted.

Soon after noon we left our elephants behind at the head of the *nulla* and struck into rough country to the north, led on by a stockily built, scantily clad hillman, who had come to meet the sahibs. After a couple of hours of clambering through the roughest country I ever saw and at a pace I hope never to have to repeat, we began

to reach the summits of the outer ranges of the hills. The prospect of seeing wild elephants at this elevation and in such rough country seemed slight to me, for I had always associated wild elephants with low-lying, swampy country. Frankly, I began to think that this was a "leg-pull," and that I was merely being initiated into the humor of the East.

But from the distance on the shoulder of a ridge we began to hear the bellowing of the elephants in the stockade and the ring of the axes of the scores of natives who were busy cutting fresh food for their hungry but unwilling guests. In spite of the reassuring sound of the axes, if there had not been two men ahead of me and one behind, I never should have gone nearer that uproar in the jungle. But we pushed on through undergrowth which showed no evidence whatever of ever having been disturbed by man or beast, until suddenly we were confronted by twelve gray bulks, separated from us by a frail-looking palisade of saplings buried in the ground at one end and lashed together with cane and creepers. The stockade was so much a part of the jungle that we had almost run into it without observing it.

The elephants were giving expression to their violent distaste for their predicament by tossing their trunks into the air and bellowing, flapping their huge ears, and rocking rhythmically from side to side. The palisade of saplings was an insufficient barrier between them and us to give much assurance of safety, for it was perfectly obvious that a good swipe of even one trunk would smash the saplings into toothpicks. The palisade was mostly for looks. The actual security and restraint lay both in the crowded condition of the stockade—for a ring of forty feet in diameter does not give much room for twelve elephants to start a stampede—and in the trench,



THE "BURNING GHAT"

An important wood-consuming institution in the holy city of Benares. Sandalwood is worth almost its weight in silver, for every Hindu aspires to have his dead body burned on a funeral pyre consisting of at least one stick of this precious wood. After the body is burned, the ashes are thrown into the Ganges and water is poured upon the charred wood to save as much as possible for future use.

five feet deep, which surrounded the stockade just inside the palisade. An elephant abhors a trench or pit of any sort, because of his clumsiness in negotiating even a small jump. He is built for running and not for jumping.

But in spite of the congestion, the trench, and the wall, the elephants apparently were not fully reconciled to their

charged that, if necessary, an elephant can get through dry jungle as easily and noiselessly as any light-footed beast in the forest.

During the first stages of the journey to the stockade the drivers had to be conspicuous by their absence and silence. The cracking of a stick, a low whistle, or cough at the psychological moment was all that was necessary to give the desired impetus to the drive. At this stage the men were doing little more than following the herd and suggesting the way that it should go. At the end of the tenth day, after having followed the elephants

incessantly mile after mile, uphill and down, the men had guided the herd into the valley which concealed the stockade. Then they began to close in and let their presence be known to the herd, maneuvering for position, beating drums, yelling, and creating a general pow-wow, until the elephants, in desperation, plunged down the hillside through the jungle toward the stockade.

Escape at the sides was impossible, because of the diverging wings of the



A NATIVE "CAR"

Forest officers often tour by bullock cart in India when the temperature is 110 in the shade. Much of the timber has to be hauled on such carts. The oval shows a native portage. The canoe used to be a bear in the Himalayas, now it is just bare skin tied tightly at all extremities and blown full of air. When floating in the water it will carry the weight of two men—dry feet not guaranteed.



fate, and if it had not been for the sharp jabs from the iron spikes in the hands of the natives, who leaned over the palisade to chastise them for merely turning an eye toward the wall, they probably would have charged and made off into the jungle in a twinkling.

It was fascinating sport to lean over the edge of the arena and watch the maneuvers of the captives and captors; but we were advised to take up a safer position in a "crow's nest" in a neighboring tree, inasmuch as the white faces and helmets of the sahibs might infuriate the elephants into undesirable activity.

Comfortably installed in the *machan*, which had been built for the use of the head *shikari*, in his day-and-night supervision of the activities below, we listened to the interpretation of his story of the drive. His party consisted of fifty picked men, experienced at the work and trained from boyhood by their fathers before them. A fortnight before, word had come to the village that a herd had been located. At first the men had spread themselves out over a large area, so that gradually but loosely they might surround the herd. It was for the *shikari* to determine in which direction the elephants were headed and how they should be driven, or rather guided, so as to get them to go toward the stockade, miles away, without knowing that they were being directed. If the wily animals began to suspect that they were being driven, they would be off as quickly and quietly as deer. It is difficult to believe that an elephant can move silently and rapidly in the jungle, but I have been told by those who have been



TRANSPORTATION DE LUXE

The elephant and the bullock cart are by no means the only mode of transport. One rides in great comfort and even luxury on Indian railroads, but it is India through which he travels, even to the monkeys on the station platform.

stockade, which, carefully camouflaged with brush and foliage, kept them in a straight and ever-narrowing path toward the gate itself. Retreat was out of the question because of the bedlam of noises in the rear and the lines of brush fire that had been started. The only safe spot was ahead, in the neck of the bottle, and in the elephants went. The heavy log gate closed with a bang by a simple but ingenious spring—a healthy sapling bent to the ground, which, when its restraining fastening was cut, straightened and pulled the gate home—and the drive was finished.

I would have gladly delayed my tour into the Darjeeling Division for the sake of seeing the elephants taken from the stockade, but my transport for five days' marches had been arranged for weeks previously, and one travels on schedule through Indian jungles or else does not travel at all. But to listen to the story as told



THE MOUNT OF PARNASSUS—A VATICAN FRESCO—IN WHICH THE AUTHOR DIRECTS ATTENTION TO THE CENTRAL FIGURE AS PROVING THE FAMILIARITY OF THE ANCIENTS WITH AN INSTRUMENT VERY LIKE OUR MODERN VIOLIN

The Making of a Violin

BY SAMUEL J. RECORD

THE origin of the violin is lost in antiquity. From the fragmentary evidence that has survived, two theories have been adduced: One holds that the instrument was the product of slow evolution, with slight changes here and there until a masterpiece resulted. The other is that the violin was really born full-grown, springing from the mind of some mathematical genius of the sixteenth century, who evolved the law for its construction from pure science and gave the complete specifications to the lute and viol-makers of the time. It is considered doubtful if these makers were even admitted into the real secret of their success, for there is no evidence that even the old masters did more than merely refine the original. Theirs was the art, but not the recipe.

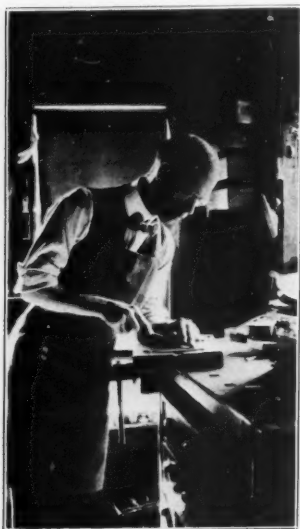
Evidence for the Minerva-like birth of the violin is supplied by the Parnassus, a Vatican fresco executed by Raphael, the great painter. The central figure in this picture holds at his shoulder the fiddle of the period, a mandolin-shaped instrument with many strings on a flat finger-board, and only the bow to suggest the violin. The exquisite detail of the picture leaves no doubt as to the correctness of the drawing, and it is passing belief that an artist would have been content to depict so crude an instrument had he been familiar with the graceful lines of the violin, so common a few years later.

Raphael died in 1520, the year of the birth of Andreas Amati, the founder of the Cremona school of violin-making and the grandfather of Nicholas, preceptor to Antonio Stradivarius. Andreas provided Charles IX of France with a set of 24 violins, and it was said of them that their workmanship was very perfect. Only one of these survived the rape of Versailles in 1790, but that one was enough to prove that to this day there has been no material change in appearance or construction.

During the latter part of the sixteenth century and the two centuries following, violin-making was among the most thriving of Italy's industries. Most famous of the old masters were Antonio Stradivarius and his rival, Joseph Guarnerius, whose successful bid for public favor is said to have been "less on account of fine workmanship than because of the force and magnificence of the style and general aspect of the instruments of his construction." When Stradivarius, full of years and honor, laid down his tools for the last time, ninety of his violins remained unsold because of the ascendancy of Guarnerius.

What a fortune those ninety would represent today, when the cheapest undamaged Strad is priced at \$10,000 and the best cannot be had for several times that amount!

The violin is an instrument of mystery that intrigues the imagination in manifold ways. Was it chance that



AT WORK ON THE SOUNDING-BOARD

real, however, is it to be ascribed to the choice of woods used, or to peculiarities of mechanical structure, or to the kind of varnish employed, or to the favorable climatic conditions of sunny Italy, or to the mellowing influences of time, or what? Therein you have it, the charm of the elusive unknown!

Whether or not perfection has been attained, it is a fact that both the violin and the bow have assumed definite make-up and form. This does not mean that violins are all of a kind, or that any two of them are exactly alike; on the contrary, the very nature of the material of construction makes exact duplication impossible. But the outlines, the materials, the structure, are fixed by traditional standards which permit of little variation. And yet so sensitive is the violin that these limits, measured often in tiny fractions of an inch, afford ample room for every maker to develop his own theories and give expression to his own individuality.



BENDING THE RIBS

brought the violin into being or was it law? If there was a law, now long forgotten, what a prize awaits him—fortune enough to rediscover it! There is a beaten path of rules and measurements, but the soul of every maker frets at blind following of old models and would stray in search for the reason why. Some say the alleged superiority of the old Italian models is but a fetish of the imagination, a sort of hero-worship craftily abetted by the dealers, who therein find their gain. Assuming the superiority is

real, however, is it to be ascribed to the choice of woods used, or to peculiarities of mechanical structure, or to the kind of varnish employed, or to the favorable climatic conditions of sunny Italy, or to the mellowing influences of time, or what? Therein you have it, the charm of the elusive unknown!

As one old white-wigged maker told the writer, "A violin takes from its maker. No matter how excellent his workmanship, a bad man cannot make a good violin. It will reflect his character and embody his racial traits and peculiarities. Transplant a successful maker to uncongenial surroundings or subject him to bad influences and you will spoil his work. Moreover, a violin takes from

a player and becomes sensitized to him. It will require weeks or months of playing by another before the effect of the old association is overcome."

Smile at such beliefs, if you will; nevertheless, in some form or other, they are widely and firmly held by the fraternity. They at least bear testimony, if such were needed, to the sensitiveness of a master violin. Here, too, is more than hint of the reason why the best violins are not produced in great factories or fabricated by automatic machines. Instead, they are the creation of individuals, in garrets and tiny workshops, in every community, each maker jealous of his handiwork, each hoping that his latest effort will prove a masterpiece. With some, it is a trade or profession; with a still greater number, it is a hobby, to be indulged in at every spare moment; but all are alike in the ardor of their devotion to the work.

It has been the writer's privilege to know several violin-makers, to watch them at their work, to learn something of the infinite pains they take to achieve success. It is the intent of this article to tell something of the ingredients, with no attempt to give the recipe for success. It takes more than wood and tools and good intentions to make a high-class instrument. A really good violin, unlike a watch, for example, is not an assembly of interchangeable parts. It is a distinct entity, with the various members fashioned and co-ordinated into one harmonious whole. Every step in the creative process must be taken with reference to a definite goal—a master violin; otherwise the most one can expect is a mere fiddle.

The structure of a violin is deceitfully simple. The two conspicuous parts are the sounding-box, or body, and neck and head. The body, the part upon which the maker devotes nearly all of his attention, consists of a thin arched sounding-board,



THE INSIDE AND OUTSIDE MOLDS



FITTING ON THE NECK AND FINGER-BOARD



Left—ROUGHLY SHAPING AND GLUING TOGETHER THE TWO PIECES OF CURLY MAPLE ARE THE FIRST STEPS IN MAKING THE BACK.

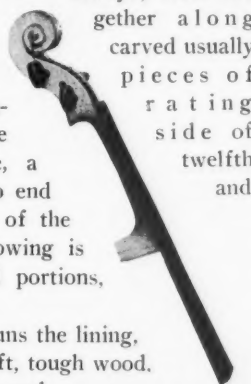
Right—THE FINELY FINISHED BACK

or belly, carved (nearly always) from two pieces of spruce glued together along the middle; an arched back, carved usually from two similarly prepared pieces of wavy-grained maple; while separately the front and back and forming the box are strips of maple, a side of an inch thick, joined end to end and twelfth known as the ribs. The part of the body narrowed to facilitate bowing is called the waist; the enlarged portions, the bouts.

Along the edges of the ribs runs the lining, composed of twelve pieces of soft, tough wood, usually willow, to add strength and provide a better gluing surface for attaching back and sounding-board.

Along the under side of the sounding board, beneath the left foot of the bridge, is a very important little strip of spruce, called the bass bar. On its dimensions and position depend to a large extent the tone of the lower strings. The bridge, which supports the strings, is of quarter-sawn maple, and its feet rest on the sounding-board, the left over the bass bar and the right near, usually just in front of, the sound post. The latter is a round piece of spruce, a quarter inch in diameter, just long enough to stand firmly in position between back and belly before the violin is strung.

The edges of both the sounding-board and the back are reinforced, as well as ornamented, by a narrow inlay, the purfling. This is about one-sixteenth inch wide and a twelfth deep and is generally made of two strips of "ebonized" wood with a strip of white between them. Holly, in the white and dyed, is often used for this purpose, though whalebone may be employed for the black parts. The neck and head are usually machine-carved from a single stick of maple or from two pieces glued together down the middle. The finger-board and the



HEAD, NECK, KEYS AND FINGER-BOARD

tail-piece are of the blackest ebony or of some wood, such as maple, that has been stained black or "ebonized." The pegs are of ebony or of rosewood.

The bow is almost invariably made of a dyewood from Brazil, usually called Pernambuco wood, though little of it now comes from Pernambuco. Letterwood from Surinam is sometimes used for bows, but it lacks the "life" characteristic of the Brazilian wood. Few violin-makers make their own bows, for bow-making is an art in itself and has its own devotees, with Tourte as the old master.

The violin-maker's greatest concern is with the sounding-board and the back; the other parts are of secondary consideration and are usually purchased ready-made. The very best material is essential to good results, and no pains are spared in its selection and conditioning. The spruce must be straight-grained, uniform, and resonant, with the proper spacing of the reeds, as the summer-wood layers are called. The "Swiss pine" of the trade is not pine, but the common European spruce (*Picea excelsa*), known also as spruce fir, Norway spruce, and white fir. When the wood is quartered, the medullary rays show as tiny flecks or mirrors and give rise to the name of silver spruce.

For the backs, only maple is used. To be sure, they call it sycamore in Europe, but that is short for sycamore maple (*Acer pseudo-platanus*). The American sycamore is quite distinct and corresponds to the European plane tree. And the maple must be curly-grained, a figure so characteristic that it has come to be known as "fiddle-back mottle." Hard maple, both the European and the American, is noted for its resonance as well as for its cabinet qualities and beauty. Moreover, those versed in the mechanics of the art say that the relative densities of maple and spruce are an important factor in their use together. However that may be, the fact remains that of the thousands of woods in the world, just



Left—THE UNDER SURFACE OF A SOUNDING-BOARD DURING THE HOLLOWING-OUT PROCESS. THE SCRATCHES ARE MADE BY THE GAUGE IN DETERMINING THE DEPTH TO WHICH THE WOOD IS TO BE REMOVED

Right—THE UNDER SIDE OF A FINISHED SOUNDING-BOARD, SHOWING BASS BAR AND FF HOLES

[Continued on page 54]

Rangers of the North

Where the Sail Takes the Place of the Saddle and Man Waits upon the Tides

BY L. C. PRATT

THE popular conception of a forest ranger is a tall, lean, tanned individual, slouching in western stock saddle astride an alert and sinewy horse, silhouetted against the sky-line, with the forest spread like a map beneath. In a sense, it is a good picture; for one can glimpse this striking figure in a great many places over a wide expanse of country. It typifies many men of the western National Forests, where a ranger without a horse is an anomaly, and the two conform pretty closely to Frederick Remington's paintings of the picturesque outdoor life of the West.

But, to get a full conception of the forest ranger, one must remember that our National Forests are scattered pretty well over the whole map of the United States and some of its outlying possessions. Ranger personnel and methods must of necessity vary as greatly as do the topography, trees, and other conditions of the individual forests themselves. One cannot well imagine a ranger in the Southwest—New Mexico or Arizona—without getting the romantic steed into the setting. But what of the ranger in Maine, in the South Atlantic

States, in Porto Rico, and in Alaska? Oh, yes, there are National Forests in all those places; and rangers, too.

Away back in 1867, when Russia sold Alaska to the United States for about two cents an acre, she threw in some 80 billion feet of commercial timber, which has a present stumpage value of \$9,000,000 more than we paid for the whole Territory. This figure includes only the timber on the Pacific slope which is now included in the

two National Forests of Alaska, no allowance being made for the vast, but more lightly timbered, regions of the interior.

The Tongass and Chugach National Forests occupy a narrow coastal strip along the Pacific slope of Alaska from the southern extremity of the Territory northerly and westerly to Afognak Island, including all of the Alexander Archipelago, with

its countless islands, bays, fiords, straits, and inlets, and Prince William Sound, with its endless narrow waterways.

The two forests have a combined area of 20,000,000 acres and a total shoreline of more than 12,000 miles—half the distance around the globe. The topography is exceedingly rugged; much of the country practically stands on end. Roads and trails are almost an unknown quantity. Owing to the heavy precipitation, averaging for the whole region more than 100 inches a year, the undergrowth is almost semi-tropical in its density. Seventy-five per cent of the timber lies within two and one-half miles of salt water and almost all forest activities are immediately along the coast.

In this region the romantic four-footed companion of the western ranger would be as out of place as a Yukon sled in the Hawaiian Islands. Here the ranger must depend largely, if not entirely, on his gas boat.

To his equipment as a forester he must add at least the rudiments of navigation; must know practical seamanship, including a working knowledge of marine engines, and enough windjammer lore to come into port under sail



THE GOOD BOAT TAVERN OF THE FOREST SERVICE FLEET. AS NECESSARY AS THE ROMANTIC STEED TO THE RANGER IN THE SOUTHWEST IS THE GAS BOAT TO THE RANGER IN OUR ALASKAN NATIONAL FORESTS

if his engine fails him. And not the least of his attainments must be a knowledge of meteorology sufficiently practical and extensive to enable him to predict with more or less accuracy the weather of tomorrow.

In Alaska the ranger's boat is not only his horse, but his camp as well—a floating home, office, and headquarters. The resourcefulness that is the heritage of all forest rangers must be developed to the nth power in Alaska, where more often than not he is entirely out of touch with the rest of the world,

and where, in case of any mishap to his boat or engine, he must make such temporary repairs as will enable him to get to the nearest settlement. His galley must always contain sufficient stores to enable him to make the trip he has planned, and enough more to see him through any unforeseen delay caused by breakdowns or storms. Being subject to frequent drenchings, his slopchest must be stocked with plenty of dry clothing and waterproofs. His engine-room must be a miniature machine shop, with sufficient tools and equipment to permit of all ordinary repairs. He must carry a set of sails for emergency use in case of incurable engine troubles. All this in addition to the tools of his primary trade of forester.

On his monthly time report, in addition to other unusual items not seen in the reports of rangers in other parts of the country, will be found a heading—"Time lost

on account of weather and tides." In the making of personal working plans this is a factor that must be reckoned with. Navigating over the shallow flats that have been built up by rivers laden with glacial silt, it is necessary to "work the tides." Channels are narrow and tortuous, and if your keel touches bottom on ebb tide, there you stay until the flood tide lifts you off, hours later. Or you may be returning to headquarters from a remote part of your district only to find that a storm, whipping with terrific force through some narrow entrance, makes it impossible for your little craft to beat across the straits. Then you must run behind some sheltered headland and patiently wait until the storm has blown itself out or subsided to a point where it is reasonably safe to buck through. This may mean a day or a week—sometimes longer.

The following extracts from a ranger's diary on the Chugach National Forest picture some of the working conditions in Alaska:

"Sept. 6.—Went aboard launch *Swan* for trip down Cook Inlet to Kasilof River. Left at 7 a. m., but hit bar a short distance offshore. We tried to get her off, but the tide ebbed too fast. Returned in skiff and finished up some odds and ends of work at ranger station. Went aboard *Swan* again at 5 p. m. Started over Turnagain Arm, but a blow came up when about half way across, and returned to Fire Island for shelter and anchored, or rather put down the hook, at 9 p. m. Anchor would not hold, so we drifted and ran all night."



A SCENE OF SURPASSING BEAUTY IN THE TONGASS—HARDING GLACIER, ON BARANOF ISLAND, ALASKA



THE HIAWATHA, FLAGSHIP OF THE FOREST SERVICE FLEET IN ALASKA, WHICH NOW CONSISTS OF TEN MOTOR-DRIVEN BOATS

"Sept. 7.—Left Fire Island at 4 a. m. Water very rough. Pulled in behind Moose Point and put boat on the beach. I walked up the beach six miles, looking for some Finn tie cutters. Got back to the boat at 3 p. m. and left at 5:30 p. m. The shore between Moose Point and East Foreland is a garden of boulders and dangerous for night running. Arrived at Kenai Indian Village at midnight."

"Sept. 8.—Left Kenai at 3 a. m. and ran to Austin's place. Put the boat on the beach, as she was leaking badly in the stern. Made temporary repairs."

"Sept. 9.—Left Austin's place at 5 a. m. and arrived at Kasilof 10 a. m. Picked up a skiff adrift on the way. Hung up on a bar at entrance of river for an hour. Ran up river to Williamson's place. Found the Williamsons at home and went over the place with them. They have the model fox ranch and are getting results, too. A modern house with all conveniences and a sewage disposal plant. Three acres are fenced for foxes and they are clearing more land for pens. They have ten goats and two horses. Mrs. Williamson attends to the feeding of the foxes and is very particular. These people are the only ones I have run across who weigh their foxes and the feed. The foxes are being raised just as the best of

stock is raised, and it certainly shows. Lost skiff getting aboard *Swan*, but picked it up again at midnight. Hit a sand bar and hung up until 3 in the morning."

"Sept. 10.—Left Kasilof River at 3 a. m. and arrived at

Kenai Village at 5:30, with a stiff sou'wester coming behind us. The *Silver Screen* went out of the river as we went in, and she was shipping the seas over her bows."

"Sept. 11.—Left Kenai at 3 a. m. Weather was too bad to land at either Salmatia or East Foreland. Arrived at headquarters at 6 p. m."

No eight-hour days here, for when weather and tide permit, either day or night, you must be on your way. In the delta areas near the mouths of the larger streams, much time is lost in waiting for favorable tides, and in exposed waters the loss is more often from unfavorable weather. Delays from these causes may amount to 50 per cent of the total time charged to "navigation." Cook Inlet adjacent to the Chugach Forest has the second highest tides in the world, with a range between high and low water of 40 feet. The tidal currents are very strong and immense land areas are uncovered at the low-water stage.

Navigation is by no means confined to salt water. In this region of few trails and fewer roads, advantage must be taken of the numerous rivers and inland lakes, where small, shallow-draft boats can be used. In this work the hazards are of a different nature, as witness the following, culled from another diary:



A FOREST OFFICER GOING ASHORE TO INSPECT THE WORK OF A SURVEYING PARTY ON THE TONGASS. IN ALASKA THE RANGER'S BOAT IS NOT ONLY HIS HORSE, BUT HIS CAMP AS WELL—A FLOATING HOME, OFFICE, AND HEADQUARTERS



TO HIS EQUIPMENT AS A FORESTER, THE RANGER MUST ADD AT LEAST THE REQUIREMENTS OF NAVIGATION. FOR A VAST NETWORK OF NAVIGABLE, NARROW WATERWAYS MAKES 75 PER CENT OF THE TIMBER ON THE ALASKAN NATIONAL FORESTS READILY ACCESSIBLE FOR LOGGING OPERATIONS

"Aug. 2. —Started up river after noon and found river overflowing banks, making progress very slow. Caving banks fill the river with sweepers, and at 3 p. m. the boat was swamped and entire outfit washed

While the Giant Redwoods Grow

By CHARLES ALMA BYERS

VISITORS to the groves of great Sequoias in California very readily feel themselves Lilliputians in a land of giants. Even with the figures before them, they often have no more than a hazy conception of how old, big, and otherwise great these giants actually are. It means very little to be told that some of these trees still living are from four thousand to five thousand years old, and that there are known specimens 340 feet tall and others more than 100 feet in circumference, with a base diameter exceeding 36 feet. In fact, these figures would probably seem just as important if they were to be cut in half. Figures, in short, appear great only when viewed in a comparative light. Therefore, let us look at the age and size of these big trees in the light of the history of man since some of these trees still living first began to grow.

We think of the discovery of America by Columbus as an event that happened a long time ago. Yet many of these forest monarchs had already, in 1492, lived for more than 3,000 years.

The calendar of Christian nations is dated from the birth of Christ, but some of these trees are more than twice as old. The holy Babe in the manger, the Star of Bethlehem, the Sermon on the Mount—all these postdate the time many of these trees began extending their branches heavenward by a score of centuries.

Ages before Cleopatra ruled as Queen of Egypt hundreds of these trees had already become forest kings. In fact, had they lived in California, Cleopatra and Mark Antony might have strolled beneath these same living trees, even then centuries old.

For more than a thousand years before the building of



Photograph by Lenwood Abbott

THE BASE OF THE GENERAL SHERMAN TREE. A BUNGALOW THIRTY FEET WIDE MIGHT BE SET IN FRONT OF THIS TREE, AND THE TREE WOULD EXTEND BEYOND IT MORE THAN THREE FEET ON EITHER SIDE. WHEN MOSES, WHO HAS BEEN DEAD FOR ABOUT 3,000 YEARS, WAS BORN, THIS TREE WAS PROBABLY A "SAPLING" SEVERAL HUNDRED YEARS OLD, AND IT IS STILL GROWING



Photograph by Lenwood Abbott

THE GENERAL SHERMAN TREE

PROBABLY MORE THAN TWICE AS OLD AS THE CHRISTIAN RELIGION. FROM COUNTING THE "GROWTH" RINGS IN FALLEN GIANTS, SEQUOIA TREES STILL LIVING ARE ESTIMATED TO BE FROM 4,000 TO 5,000 YEARS OLD. NOTE THE TINY HUMAN FIGURES AT THE BASE OF THE TREE

the Parthenon Temple of Athena, on the Acropolis at Athens, Greece, about 438 B. C., some of these trees were living things.

Solomon, king of Israel and son of David, lived from 1033 to 975 B. C. Solomon's Temple belongs to antiquity, but in California are still alive and growing giant Sequoias which had lived for centuries before the building of this temple.

Moses, the great Jewish lawgiver and leader of the Israelites from Egypt, has been dead about three thousand years, but trees still thriving were thousand-year-old saplings before he was born.

Rameses II reigned over Egypt about 1300-1280 B. C., warring with Khita, supposed to be the Hittites of Biblical history, and extending Egyptian dominion over Ethiopia. He has been a mummy for upward of thirty centuries, but not for so long as some of these California trees have lived.

Cheops, the Egyptian despot, built the Great Pyramid about 2800 B. C. It is said that he employed 100,000 men on the job during the twenty-three years of its building. The Great Pyramid is a rather antique landmark, but among our groves of



Photograph by Lenwood Abbott

THE THEODORE ROOSEVELT TREE

CENTURIES BEFORE CLEOPATRA WAS EGYPT'S QUEEN MANY OF THESE TREES WERE FOREST KINGS. ONE TREE WOULD PRODUCE SEVERAL CARLOADS OF MERCHANTABLE LUMBER, OR ENOUGH TO BUILD ABOUT TWO BLOCKS OF FIVE-ROOM MODERN BUNGALOWS

big trees are probably living specimens which would have supplied fair-sized "shillalies" for Cheops' bosses.

This manner of illustrating the antiquity of these trees might be extended indefinitely, but now let us turn to a consideration of the trees with regard to size and what they could be made to produce.

While it is believed that there may be others still taller, the tallest Sequoia tree yet discovered towers to about 340 feet. The average height of a ten-story office building is somewhere around 120 feet. Hence, one might pile two such buildings, one on top of the other, beside one of these giants and the tree would reach about 100 feet higher.

The Statue of Liberty in New York harbor is, from the foundation of the pedestal to the upheld torch, a total of 305½ feet high. The dome of the Capitol Building in Washington towers 307½ feet above the esplanade. Either, however, could be set beside this tree and would be out-classed in height.

The General Sherman Tree, in the Giant Grove of the Sequoia National Park, is over 36 feet in diameter and more than 102 feet in base circumference. Place a bungalow thirty feet wide before its base, and the tree will extend outward on either side more than three feet; or, were the tree to be sawed off at its base, a house thirty feet square could be set on the stump, leaving a comparatively small overextension at the corners.

It is estimated that a single one of the larger trees would

produce somewhere around 300,000 feet of lumber. An ordinary carload of lumber is comprised of about 30,000 feet. Hence, it would require a train of ten cars to haul the lumber produced from a single tree, and several more cars to carry away the waste in the form of firewood.

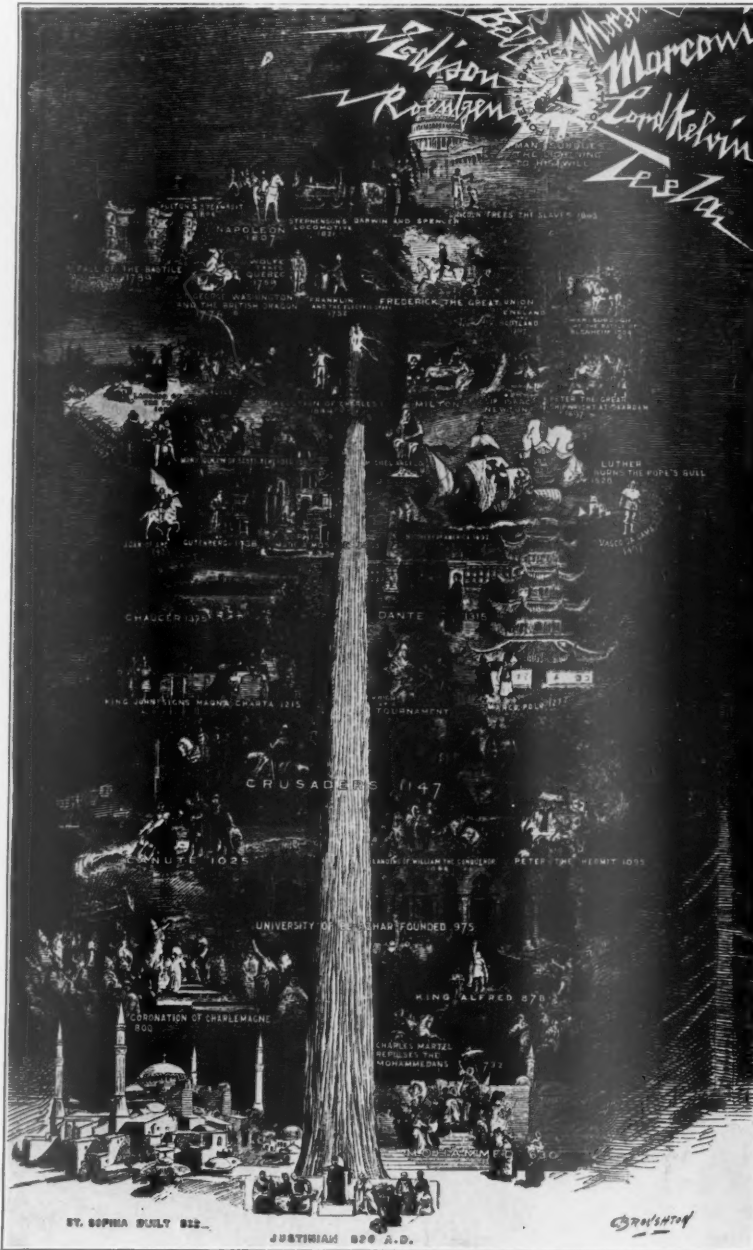
Or, to give another illustration, an ordinary five-room cottage contains from 5,000 to 6,000 feet of lumber of all kinds, which means that one of these big trees is capable of producing enough lumber to build fifty or sixty houses.

One of the many named trees in the Sequoia National Park is called the Abraham Lincoln Tree. Abe Lincoln was a great and famous rail-splitter; but, with an average production of 150 rails a day, he might have labored on the one tree named for him for more than four years before completing the job.

So much, and enough, for the "relativity" story of the big Sequoias. The rest of the story, being the more familiar part, may be told in comparatively few words.

In the Sequoia National Park and the General Grant National Park, both located in eastern central California, these

big trees are preserved to the American people for all time. Originally established in 1890, these parks, with their more recent additions, now embrace 164,157 acres and contain thirteen separate groves, with nearly 1,500 trees which have a diameter exceeding ten feet. Others of these trees are preserved in the Yosemite National Park.



A GLANCE BACK OVER THE PAGES OF HISTORY AND A FEW OUTSTANDING MILESTONES MARKING WORLD PROGRESS DURING THE GROWTH OF A GREAT REDWOOD TREE

"In and Out of the Chimney Tree"

BY PAULINE GRACE HUNT

IN THE Sempervirens Forest, Santa Cruz County, California, there are a number of standing hollow redwood trees—tombs, one might call them—made so by destructive fires a century or more ago. Although the hearts seem to have been devoured, there is still enough life in the roots and the bark to send out shoots

where the hollow runs clear to the top, showing no life on the outside, yet apparently having enough purchase in the earth to keep it standing for centuries still. This giant tomb is called "The Chimney Tree," and when the wind blows just right, it is said a soft, crooning sound like the voice of an old squaw in lullaby, can be heard emanating from the hollow.

Around this tree and inside, children love to play a game originated many years ago by an Indian pioneer. The children don their Indian play suits and skip about the tree, chanting the following lines:

"In and out of the Chimney Tree
Comes a lullaby sweet to me.
Indian maidens all are we,
Skipping around the Chimney Tree.

Oh, magic voice of the Chimney Tree,
Tell what our future is to be!
Say not Rome we shall soon see,
For we wish to stay at the Chimney Tree.

Oh, la, la, la, and lee, lee, lee!
Forever we'll skip at the Chimney Tree!"



Photograph by Charles Wagner

"INDIAN MAIDENS ALL ARE WE,
SKIPPING AROUND THE CHIMNEY TREE."

near the top, and this curiosity attracts the interest of all tourists. But the most interesting of this group is one

Then if a tame squirrel enters the tree while the girls are skipping, it is taken to mean that another girl will soon be added to the clan; but if no squirrel enters, they consider it a presentiment that one girl will drop out, possibly be taken to her home, as her vacation will have ended. Sometimes a squirrel will clutch the bark and run far up the outside of the tree. This means to the little girls that one of the group will win high honors in a career. If the squirrel carries a nut, very good indeed, if he places it securely in a pocket of the bark; but if he drops it, the girl is likely to experience some trials in her climb to success. If a number of squirrels come and frolic about, as the girls skip, it means that all shall be successful, and if all the squirrels bring nuts, then all the girls will have "much wampum" and will "lay by" for rainy days.

The Eternal Alchemy

There is a quiet courage in the way
That Nature takes the ravages of men
And turns them into beauty. Scarce a day
And what was sear and ugly blooms again.
Here, where the ax defiled a virgin wood,
Spring from the wreck new branches, sturdy, bold;
And that bruised hill, where hands in greedy mood
Foraged for ore, now shines with living gold,

Where flaming poppies flaunt to arrant winds
Their swift and certain challenge to disdain
And here, where careless fire was set, one finds
Hardly a recollection of old pain
In these white wings of butterflies that pass
And lightly kiss the fingers of the grass.

—New York Herald.



Trailing the Caribou Herds

By O. J. MURIE

United States Biological Survey

PROBABLY the most interesting feature about the caribou is their periodic migrations. They are nearly always on the move—sometimes in small groups, occasionally in immense herds.

When I first came to Alaska, in the interests of the Bureau of Biological Survey, I heard great tales of the caribou migrations. Prospectors had seen the "hills covered with caribou," "traveling day and night," "thousands of caribou," under a great variety of circumstances. I was thrilled by these accounts and eager for such adventures. For a long time I was disappointed. Plenty of caribou, it is true, but nothing spectacular, until I doubted many of the reports and thought them mostly exaggerations. However, after a considerable time in the field, I saw that accounts had not been so much exaggerated as I had thought at first.

It often happens that a casual observer will meet with experiences which another, who is definitely seeking them, will miss. One summer I traveled through the upper Forty-mile country, hunting for the caribou herds on the summer range. I met a prospector at Ketchumstock and we camped together that night. He had just come over from the Tanana and only a day or two previously had passed a large herd of caribou. They passed by him for hours in a more or less steady stream; he estimated fifteen or twenty thousand. The exact location and direction of their travel was carefully explained to me, and I went off next day hopefully; but all I ever found were a few straggling groups.

On my return, a week later, I stopped with a homesteader on Mosquito Flats. "Just two days too late," he told me. Several days he had been busy keeping a herd

of caribou off a choice patch of wild hay, firing guns and making all the noise possible. He was fagged out from lack of sleep. This herd was estimated to number thirty thousand. I saw their trails—in fact, the whole country was cut by trails—but the large herds eluded me.

One spring I was fortunate in meeting the caribou in greater numbers. This was at Tanana Crossing, in April. I first spied the trails in the snow along the face of the Alaska Range; then with the aid of the glasses found little groups of black dots on the background of white. In a few hours I was on the mountain slopes among the caribou. They traveled in single file and most of them came over the top of the range. They had wintered south of the mountains and were now returning to their summer grounds. I was surprised to see them come over a high mountain top.

Just below the summit was a steep slope, drifted with snow. Without hesitation, each one set his feet and coasted down, until a deep groove had been gouged in the snow. A deep hollow, or draw, lay across their path, and I stationed myself at the brink of it, where their trail emerged. One by one they filed by me, travel-worn by a long journey, their coats shaggy and tattered, and with a listless appearance. Each one glanced at me suspiciously as he passed, swerving a little to one side, and then went on with the others. Occasionally they gathered into a scattered group and stopped to feed a while.

I counted something over 600 in one such herd. This run lasted for about three days; then they were gone, probably into the hills between the Tanana and the Yukon, at the head of Goodpaster River, where they would feed during the summer and raise their calves.

When caribou are plentiful one becomes accustomed to them, and a passing band will hardly cause a flutter of excitement. Then comes a time when one will give almost anything for the sight of one. One February I desired several specimens. It was already late in the season for securing skins in good pelage and I began to fear that I would find none. I had traveled over two hundred miles already. One evening a deserted prospector's cabin on a small tributary of Chatanika River furnished me a comfortable camp. The sled was unloaded, the dogs tied up for the night, and then I strolled up the creek with my rifle. Around a bend in the creek a rounded dome came into view, rising above the timber at the head of the creek, and dotted with caribou. They were feeding quietly and I hurried on, hoping to reach them before sundown.

Daylight was waning and it became a race. Above timber the slope was steeper and slowed me up, but the caribou loomed up on the skyline, distinct and not far distant now, a hundred or more. The higher I climbed, the slower my pace. The sun was down, dusk already settling. Some caribou were just over a knoll and I stopped to get my breath. A star was already twinkling overhead. It was a little difficult to choose the type of animal wanted. I strained my eyes in an effort at an approximate aim, and then fired. A reassuring "punk!" and the caribou toppled over, the rest of the band galloping off in the gathering darkness.

The animal was down. Now to measure and skin it, as the carcass might freeze over night. Somehow the hide was worried off and draped over my shoulders. Then off for camp—through willows, deep snowdrifts, slipping and stumbling in the dark, but eventually I arrived at the little camp, happy in the thought that at least one specimen was safe.

Next morning I drove to the head of the creek with the dog team, tied the dogs in the last timber, and went off for the day after more caribou, for two more skins

were wanted. The hunt was successful, but it was evening before I returned to the dog sled with my load. The dogs, tied up all day, were restless and wild to be off, howling and jumping while being harnessed. The specimens were lashed to the sled and I let them go. The dogs gave vent to their pent-up energy at racing speed.

Occasionally the brake was put down to check our speed around a turn or to dodge a stump. Then we

came to the overflow.

The stream had been flooded repeatedly over successive layers of ice, and here lay before us a long stretch of glare ice, with willows protruding everywhere. The brake wouldn't hold here, and I could no longer check the speed. The dogs were in high glee. Queenie, the leader, stretched out at her best speed, and the sled's momentum increased. In spite of my desperate efforts to keep it straight, the sled swerved and swung here and there. Then a clump of willows loomed in front. "Crash!"—the sled banged into the brush, slid up over the bunch and we went merrily on our way. After that I let it go, happen what might. Miraculously, the sled remained upright until finally we reached the snow once more and the brake

took hold. A broken sled is a serious predicament sometimes, but I wouldn't have missed that ride.

CARIBOU AND REINDEER

The investigations among the caribou have had as one object to find out where the largest species are to be found, in order that bulls might be captured for breeding with the reindeer. There are probably about 200,000 reindeer in Alaska. Eventually the reindeer industry will be an important resource. The Biological Survey has undertaken to encourage this industry in every way possible—by studying the diseases of the reindeer, food and range problems, methods of handling, etc. Just as beef cattle have been improved by careful breeding and selection, so the reindeer can be improved—in size, vigor, and meat-producing qualities. Introduction of native



A BULL CARIBOU IN FULL DRESS

This photograph is of a drawing by the author and shows the white neck and shoulders and the mature antlers during the rutting season.

caribou in the herds, with careful control of breeding, will tend to effect these results.

This summer we are engaged in the project of capturing some caribou bulls for experimenting along these lines. On upper Savage River, in Mount McKinley Park, a corral has been built with two lead fences reaching across the valley in V-shape. On the slopes above, on either side, we lie in wait. When the caribou come down the valley and are fairly between the wing fences, we all rush down behind and drive them in. Sometimes we have a tedious wait.

CAPTURING A BULL CARIBOU

One day while doing some work on the fence some one exclaimed, "Caribou!" and pointed to a ridge. A cow and calf were sauntering along, feeding. We hurried to our stations and waited. This was just after dinner. The afternoon slowly passed, and still the cow and calf fed leisurely on the same slope. Then they lay down and we waited patiently. The sun went low, evening came on, but the cow was in no hurry. A cold breeze had been coming down the valley and we shivered as we lay in hiding. Late in the evening the cow arose and began feeding again; then actually started down the valley.

Suddenly a bull appeared, from nowhere it seemed, and all three fed quietly for a time, while we could hardly control our chattering teeth. When our patience was about gone they started definitely downstream, fairly between the lead fences. We let them go as far as they would before disturbing them, and they marched nearly up to the corral gate. Then we all leaped into action, running toward the gate, five abreast. The caribou tried to turn back, but seemed to meet a man wherever they went. They turned again, and after prancing around a bit, undecided, entered the corral. Now we raced in earnest, each one eager to close the gate. I lost out in the scramble, but heard the slam of the gate—a welcome sound!

It was late, but we decided to rope the animals at once, for fear the calf might be trampled by the others. After driving them into a smaller compartment, some one pounced on the calf and had it hog-tied; another had the cow down, and some one else had a rope on the bull, a fine three-year-old. Halter and hobbles were placed on the cow and calf and they were tethered for the time being in the large enclosure. The bull was not so easily handled, and we were thoroughly warmed before we had him in control. His menacing antlers were sawed off, hobbles fastened to his front feet, and he was given the freedom of the small pen. We returned to camp well satisfied with the day's work.

CONSERVE THE CARIBOU

The calf proved to be a female. As only bulls were wanted, we kept the cow and calf under observation for a day or two to study their behavior, then turned them loose. Before the season is over, we hope to have a number of healthy young bulls with which to conduct experiments in breeding with the reindeer.



THE SUMMER COAT OF THE CARIBOU

In this picture the author has portrayed the summer dress of the caribou. Note the antlers in the velvet.

One of the chief features of Alaska is its wild life. With its healthful bracing climate, its mountains and its tundras, the herds of big game, Alaska, our last frontier, has a rugged charm peculiar to itself. The caribou herds are not the least of its attractions. At present the caribou are thriving. This, then, is the time to handle them wisely, that they may remain a permanent Alaskan resource. This game should be used as needed, but used sensibly, just as a rancher will use his stock, insuring a future supply, so that in years to come this species will not join the buffalo, but we may still have the big "caribou runs."

Announcement of Annual Meeting

The annual meeting of the American Forestry Association will be held in New York City at the Hotel Commodore on Wednesday, January 23.

The meeting will be in the nature of an evening dinner at seven o'clock, and will be featured by a number of addresses by men prominent in public life. Immediately preceding the dinner, at six-thirty, a business session of the Association will be held at the same hotel. Members are urged to attend both meetings, and to bring their friends. Reservations for dinner should be made in advance, by writing the Secretary of the Association, 1523 L Street N. W., Washington, D. C.

A Hundred Million Dollars Needed for Forests

The American Forestry Association Urges Upon Congress the Immediate Adoption of a Far-Sighted Program of Public Forests

IN RECOGNITION of the urgency of the forest situation in the United States, the American Forestry Association has urged upon Congress the immediate formulation of a forest program which may become operative at once. This program, while not attempting to meet all forest questions at the present time, centers about an enlarged plan of public forests made possible at once by an authorization of \$100,000,000 by Congress. It is the idea that this sum will become available from year to year during the next ten years, as the condition of the Federal Treasury may permit. The Directors of the Association, in a statement presented by O. M. Butler to the Senate Reforestation Committee at its hearings in Washington on November 23, summarized their recommendations as follows:

"The Directors of the American Forestry Association desire to emphasize the special importance of a program of acquisition of public forests national in scope and on a scale really commensurate with the public interest involved. It is our belief that this program should include the establishment of national forests, not only for the protection of watersheds, but also for the production of timber; to serve as centers of fire protection and as demonstration areas in building up private forestry, and to provide other public benefits.

"It is our belief that this enlarged program should be projected ahead, and that its real scope should be recognized by Congress at the present time. We believe that there should be formulated at once a far-sighted program, extending over a period of years, applied to the nation as a whole, analogous to the general program adopted by Congress for purchases in New England and the Southern Appalachians under the Weeks Law. We believe, further, that this program should be made immediately operative

by an authorization by Congress of not less than \$100,000,000, to be appropriated from year to year in accordance with the condition of the Treasury.

"In making this recommendation it is recognized that the establishment of such a policy involves the determination, through the proper agency, of the constitutionality of purchasing for public benefits forest lands other than those acquired for the protection of the navigability of navigable streams."

The Directors of the Association believe that if the people of the United States are to be assured of a continuing supply of timber, federal action and leadership must be the foundation of any comprehensive and successful forest policy, and that action and leadership on an enlarged scale must begin at once. The Association is sponsoring a bill providing that Congress make available the sum stated, in order that adequate public forests may be established throughout the nation as demonstration areas in stimulating private endeavor in forestry, forest fire protection, and public appreciation of forests for industrial and social requirements.

The Association urges that all its members enlist in active service in promoting this program as the cornerstone of an adequate forest policy for the nation. Now is the time for every one who has the forest movement sincerely at heart to make known his opinions to Senators and Congressmen. Much more than this can be done. Forest conservation in America needs more missionaries. Let every member of the Association appoint himself a missionary and endeavor to stimulate those about him, in all walks of life, to an appreciation of our forest needs, and particularly to the necessity of giving active support, individually or by organized opinion, to the movement for more public forests.

Gethsemane Olive Trees

Just outside of Jerusalem, on the slopes of the Mount of Olives, lies the Garden of Gethsemane. It is a quiet, secluded spot, about one-third of an acre in extent, surrounded by a high wall, and belongs to the Franciscan monks. It is laid out in beautiful flower beds. The chief object of interest, however, is a venerable olive tree, shown in this picture. This tree dates back to the time of Christ. Just inside the entrance is the traditional spot of the betrayal and the place where the disciples slept while Christ was in agony of intercession. The spot is a placid, peaceful one, that seems to breathe a spirit of harmony and good will in contrast with its great and solemn history.—

H. E. ZIMMERMAN.



The X-Ray Study of Flowers

By JOHN D. MACRAE, M. D.

In Which a Fascinating Hobby—For Those Who Can Afford it—is Described by the Author, a Medical Man of Repute, Who, in Endeavoring to Perfect the Making of Ordinary Radiograms, Discovered How Beautifully the Delicate Structure of Flowers and Plants Lends Itself to This Form of Photography

THE illustrations for this article are made with X-rays, just as we make radiograms of different parts of the body. In the same way that the interior structures of the

chest are shown by radiography, we are able to picture in detail the fine internal structure of flowers.

I first undertook this study in the routine work of my laboratory, in an effort to improve the methods of making ordinary radiograms. Flowers, being infinitely delicate in structure, tax one's ingenuity to the utmost in the matter of producing radiographic negatives rich in detail. X-ray studies of the human body require greater and greater perfection of technic; so we set about making the most perfect flower radiograms possible as standards for comparison when making X-ray pictures of the lungs or other soft parts of the body.

The flower radiographs have proved to be so beautiful that I have collected specimens of many of the flowers to be found in western North Carolina and pictured them in this way. Some people ask why I do it, and others wonder at the fineness of detail and the grace of form and structure shown. I would like to know what reactions are produced by them in the minds of lovers of art and of flowers.

When asked, "Why do you make X-ray pictures of flowers?" I have not been able to point to any return in the nature of financial gain, and it is rather an expensive pastime. I have been drawn on by the beauty of it, and I want to see if the method will not add usefulness to studying and teaching botany. It is possible to show the anatomy of a flower without dissecting it. Seed can be seen inside the seed-pod, the stamen and pistils are visible within the unopened flower, and a good deal can be learned about their character and arrangement. Radiographic negatives of certain flowers can be reduced to lantern slides and used for instruction in class-work.

Oscar Wilde says that "Art reveals to us Nature's lack of design." In reality, Nature furnishes us our perfect designs and Art appropriates them to her use. The flower radiogram shows of how little importance color is in depicting grace of form and structure. It suggests and furnishes designs which would decorate any fan, vase, screen, or other object of art.

Hunting out the rarer specimens in our protected forests has been a pleasant part of this work. In fact, as a "hobby" it has been a happy diversion from the constant consideration of sickness. It points out one of the little-thought-of uses of the Forest Preserves. Where the mountain sides have been cut over, the more delicate and rare flowers are scarce. They have been found deep in the woods, where the timberman has been prevented from destroying trees and undergrowth and the foresters have prevented fire from devastating.



PINK LADY'S SLIPPER—MOCCASIN FLOWER (CYPRIPEDIUM ACAULE). THE SCAPE IS NOT SHOWN. THE FLOWER IS FOUND FROM SOUTHERN CANADA, SOUTHWARD TO TENNESSEE AND NORTH CAROLINA

SEARCHING the SOUTH

X-Ray Studies of Fa



*Queen Anne's Lace—Wild
Carrot—Bird's Nest*
(*Caucus carota*)

*Found east of the Missis-
sippi, in fields and waste
places, from June to Sep-
tember*



Indian Pipe—Corpse Flower
(*Monotropa uniflora*)

*A parasite generally without color in
flower or stem, though sometimes seen
with a delicate pink tint. Found in the
dark woods from June to August*



Yellow Fringed Or
(*Halenia ciliaris*)

Found from Maine to Michigan and south

SOUL of the FLOWERS

lies of Familiar Plants



ow Fringed Orchis

(*Halenia ciliaris*)

Michigan and southward to the Gulf States

Common Bur—Spear
Thistle

(*Cirsium lanceolatum*)

Found from July to November, from Newfoundland to Georgia and west to Minnesota, Nebraska, and Missouri; also in Europe and Asia

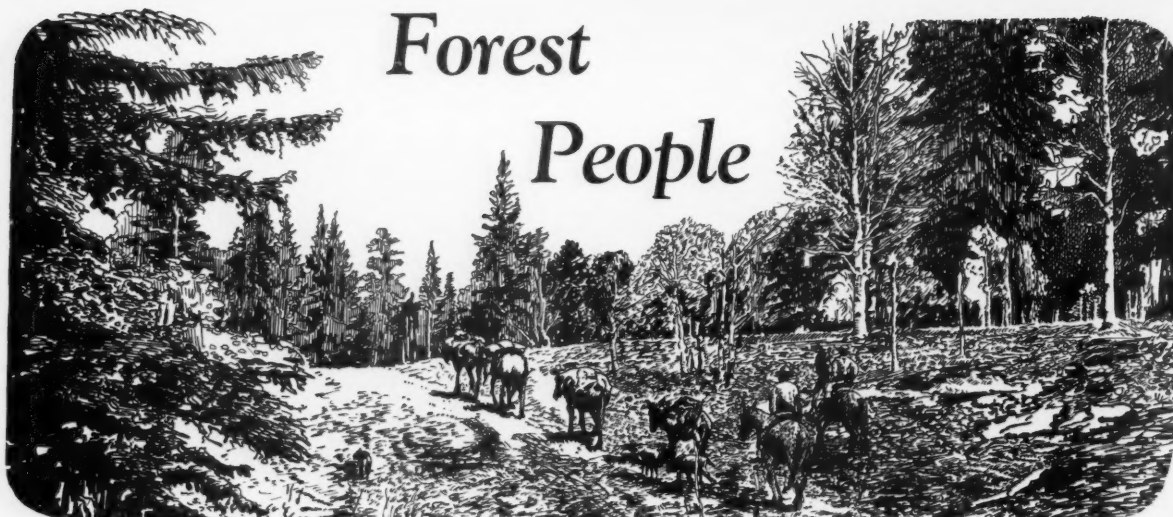


Rhododendron—Great Laurel

(*Rhododendron maximum*)

Flowers during June and July. Found in deep, damp woods and on hillsides from Nova Scotia, Ontario, and Ohio to Georgia





Forest People

THIS column is devoted to stories about real men and women who are doing original, interesting, and worth-while things in the forests or in any field relating to the forests. Do you know of any one in your town or state who is a true friend and lover of the forests, and who is showing it by setting an example in the growing and care of trees, the protection of birds, wild animals and wild flowers, the advancement of outdoor recreation, forest education, wood utilization, lumbering, or any other realm of America's woodlands? If you do, tell our readers about them.

Girard, A Timber-faring Man of the Mountains

BY MAX ELGIN

"HOW did it happen, Jim?" I asked.

"It was about like this," said Jim, hesitatingly. "On the 19th of August we were in the Oxford Ranger District, near the Bungalow Station, on the North Fork of Clearwater River. We were fighting three bad fires in that region—the Elk Mountain Fire, Larson Creek fire, and the Sheep Mountain Ridge fire. It had been very smoky for several days, but the morning of the 19th broke clear and bright. From my experience with previous fires, I knew the stage was well set for bad crown fires that day, but I sought to make the best of this one opportunity to get out and scout the country for a new camp site on Sheep Mountain Ridge.

"I left camp about 11 o'clock, after starting a crew with pack-train and equipment to establish a new camp about two miles east of Elk Mountain. I had gone only about a mile and a half from the Bungalow Station when a big cloud of smoke rolled up from the Elk Mountain fire on the river above; so I decided the best thing to do was to hurry down the river to an old burn before I got cut off. I negotiated a little bend in the trail, which enabled me to get a good view down the river, where my eye caught a massive cloud of smoke several miles below, which seemed to be coming my way. After watching the smoke for a few seconds, its action indicated that the fire was being driven by a terrific wind; so, yielding to the universal axiom that 'self-preservation is the first law of nature,' I decided the only thing for me to do was to hit for the river.

"There happened to be a sharp bend in the river where

it cuts through canyon-like walls about twelve or fifteen feet high, with a large rock projecting out over the stream. I concluded that under this rock was the best place for me to camp. I first sat down on the rock to watch the progress of the fire. It must have been driven by a forty-mile wind, which was starting spot fires at least one-half mile ahead of the main fire. The fire coming up the river seemed to become more wild the closer it got to me, and in some freakish manner completely jumped a small basin about a mile wide, between two low ridges. The fire coming down the river first commanded my attention by a cloud of black gaseous smoke which nearly put me out of business. The gas filled my lungs and completely shut off my respiration. It only lasted for a few seconds, but that was long enough. I lost no time in climbing down to the river bank and building a rock wall about four feet high, extending out in the stream a short distance.

"A minute later the whole world seemed to be on fire. I got down behind the wall I had built and had my submergible apparatus all ready when the fire went over me. It probably did not last longer than fifteen minutes, but it seemed ages to me. During about five minutes of this time the sky was as dark as a dungeon; but, except in my erratic imagination, I do not believe I was in any great danger at any time. There seemed always to be fresh air just at the surface of the water, and by the use of a moistened handkerchief I do not believe any one would have particular difficulty from smoky or gaseous atmosphere. The temperature of the water was not immedi-

ately affected, but became noticeably warmer in a short while after the fire passed over—not so much from the heat of the fire as from the hot boulders and burning logs which rolled into the river.

"I was at this point on the river from about 1 o'clock in the afternoon until 6:30 the next morning, not because of the heat from the fire, but because of the danger from falling trees and rolling boulders. The only witnesses to my experience were squirrels, chipmunks, mink, and marten, which filed past me in greater numbers than you would expect from the liberated menagerie of the Barnum and Bailey Circus, sputtering and chattering in a language unintelligible to smart people. They all seemed to be running from the upper fire toward the lower one, which was coming up the river. I thought, 'You fellows are crazier than I am,' but it subsequently developed that they evidently congregated in that little basin that the fire jumped, and all of them came through without a singe. Probably if I had displayed the supersense they did, and had gone a mile or so farther down the river, I would have escaped the hazard completely."

"How about the story that you made your will there by the river?"

"Yes, I'll admit it," replied Jim. "I thought my time had come; so I scribbled out a will on a sheet from my note book and put it under a stone on a rocky ledge, where it might be found later. It may be there yet, for all I know."

The man who told this experience is James W. Girard, whose name is a byword on the National Forests of Montana and northern Idaho. Go into the back country of those mountainous states and the chances are you will not be long in hearing about Jim Girard, the fire-eating boss of Uncle Sam's forest fire fighters. But Jim's experiences are not confined to Montana and northern Idaho. Uncle Sam soon recognized in him an all-around timberman and has dispatched him on special forest business to almost every part of the West where timber grows.

Jim always makes good, too. For example, on one

occasion he was sent into a new district to take charge of a crew of hard-boiled fire-fighters of the I. W. W. fraternity, to whom the name "Girard" meant nothing. One of the grimy fire-fighters, after looking Jim over critically, upon his arrival, declared openly that he didn't propose to be bossed by any tenderfoot from the East, so he reckoned he would be "hittin'" the trail.

"Tenderfoot, eh!" said Jim. "Here is a five-dollar gold piece says you don't know straight up about making fire-lines. Get a fire hoe and I'll show you."

The other men, sensing a contest and possibly a fight, quickly laid off a course through a brushy stretch of the forest, and then the race of grubbing out a fire-line began, amidst the profane taunts, cheers, and laughter of the piratical fire-fighters. But Jim very quickly outdistanced his man and finished so far in the lead that when he looked back the latter had vanished, unable to endure the jibes and laughter of his companions. No one in camp questioned Jim as boss after that.

For fifteen years Jim Girard has given the best that is in him to the United States Forest Service. Born in the mountains of Tennessee, he has been a timber-faring man ever since he left school, at the age of thirteen years. The lure of the West drew him to Montana in 1907, and when he learned about Uncle Sam's service to protect the forests, Jim promptly signed up, and soon demonstrated that his head was as good as his

body was strong. He rapidly passed upward through one grade after another until he became the chief logging engineer of the Montana and northern Idaho District, and was directly responsible for determining the price at which the Government should advertise its timber for sale—a responsibility which calls for an accurate and intimate knowledge of trees, lumber, logging, sawmilling, and railroad transportation.

In the appraisal of large tracts of timber or the handling of large forest fires, Girard is equally competent. It came to be the custom for the District Forester to assign him to the largest fires and the largest timber



JIM GIRARD, CALLED THE "FIRE-EATING BOSS OF UNCLE SAM'S FOREST FIRE FIGHTERS"

Forest Crops as Railway Tonnage

A Striking Example of What the Management of Forest Lands for Wood Products Means to the Railroads

By DAVID T. MASON

IT IS curious that while many of the important railways in the United States have shown intense interest in settling and developing great regions of agricultural land in various parts of the country, they have apparently given little or no effective thought to huge areas of land best suited for the production of timber crops. When interested in such land at all, the railways have sometimes tried to force its development for farming or range purposes rather than for use in producing new forests. Little do the railways apparently realize the immense importance from a tonnage point of view of keeping forest lands productive.

A few railways in certain parts of the country have had brought home to them the unfortunate effect of cutting forests without replacing them with new growth. For example, an examination of the situation in Michigan by Professor Watson, of the University of Michigan, shows that in the case of three of the important railways the tonnage of forest products handled has dropped from three and one-half million tons in 1910 to one and one-tenth million tons in 1920. The four million acres of forest lands upon which these railways are largely dependent for their tonnage of forest products are capable of furnishing continuously, under proper forest management, four million tons of green logs annually, which, when manufactured, will cut one and one-half million tons of finished products. These railroads now realize the need for reforestation in Michi-

gan, but the knowledge comes too late to be useful in keeping millions of acres of forest lands in Michigan continuously productive.

The situation is quite different in most parts of the West, where there is still a large quantity of old growth timber left; here the forests may be so managed that the railway tonnage handled may be perpetually main-

tained. This is a matter of enormous importance to the western roads, whose tonnage consists so largely of forest products.

The writer has had occasion to investigate in considerable detail the forest situation in the West, especially in the redwood region of northwestern California. In the course of this work the problem of railway tonnage became of interest. It seemed desirable to find out what California farm lands can produce in the way of tonnage as compared with redwood forest lands under intensive forest management. Prof. R. L. Adams, of the University of California, has for years been studying the productivity of California farm lands and has available much data on the subject. His studies show that on non-irrigated agricultural land in California the crops of various sorts



"GOOD TONNAGE"

A 65-year-old stand of second-growth redwood. Ninety per cent of the redwood forest land is unfit for farm crops, but under forest management it will yield 2,400 to 4,800 tons of wood an acre every year for all time.

average per acre, year in and year out, about as indicated in the table below (the figures expressing weight in pounds):

Grains:		Vegetables:	
Corn	1,000	Navy beans	1,000
Barley	1,000	Lima beans	1,600
Oats	900	Asparagus	2,500
Wheat	500	Sugar beets	20,000

Fruits, not dried:

Cherries	4,000
Peaches	7,000
Table grapes	8,000
Pears	10,000
Prunes	10,000

Fruits, dried:

Apricots	1,500
Raisins	2,000
Pears	2,000
Prunes	4,000

Vegetables:

Tomatoes	20,000
Potatoes	6,000
Cabbage	20,000
Onions	15,000

Miscellaneous:

Cotton	400
Walnuts	1,000
Hops	1,400
Olives	1,500
Grain hay	2,000

It will be noted that with some of the crops, like wheat, oats, and hay, part of the crop must be retained on the farm for seed or for feed. Such crops as sugar beets, while very heavy, are shipped only short distances to refineries, where they are greatly reduced in weight before long-distance shipping.

The writer has been unable to secure authoritative data as to the production of live stock on ranges, but from some rather fragmentary data it is estimated that fairly good range land will annually produce per acre approximately 100 pounds live weight of cattle or sheep.

In the case of the redwood forest lands, at least 90 per cent of the area is wholly unfit for the production of farm crops. If such lands are devoted to live-stock raising, the production will probably be about 100 pounds shipping weight per acre per year, and this can be obtained only by spending money from year to year to keep the range free from brush and redwood sprouts and to seed the range to forage plants. The Northwestern Pacific Railway has been built into the heart of this region, at a cost of many millions of dollars. There is so little agricultural land in the region that it is quite safe to say that if the supply of forest products ever fail this railway as a source of tonnage, it can scarcely afford to continue to operate. Fortunately for this railway, the principal redwood lumbermen have recently adopted the policy of operating their properties for the perpetual production of crops of timber under intensive forest management.

Average redwood land, under intensive forest management, will produce per acre per year at least 2,400 pounds shipping weight of dry lumber. In addition, when the demand becomes as strong for wood fiber in the West as it is in the East today, there will be about 1,200 pounds shipping weight of material obtained from thinning the immature second-growth forests. Furthermore, it is highly probable that redwood bark will some time become an important source of raw material, in which case there will be a still further product, amounting to about 1,200 pounds shipping weight per acre per year. Redwood

lands, then, can be counted upon under intensive forest management to yield somewhere from 2,400 pounds to 4,800 pounds per acre per year perpetually.

The Douglas fir region of western Washington and western Oregon also is capable of producing heavy tonnage crops of great importance to the railways, although the production in the Douglas fir region will not be quite so heavy per acre as in the redwood region.

If all of the wood fiber in the forest crop is utilized, without much waste, as quite likely it will be some time, a still heavier tonnage will be produced in both of the regions than indicated above.

The two regions mentioned constitute the ones of most rapid forest growth in the West; but other regions, such as the California pine region and the forests of the Inland Empire, are also capable of producing good tonnage yields of forest crops.

Although this article is dealing mainly with conditions in western United States, it may be stated parenthetically that the

pine region of the Southern Atlantic and Gulf States is one where forest growth is rapid and great areas of land are best suited to producing forests. This is also true of large portions of the Middle Atlantic, New England, and Lake States. Although the rates of growth average somewhat less than in the redwoods, it is not uncommon for good forest land in both the South and New England



FUTURE TONNAGE

A young forest of second-growth pine in the South which is accumulating tonnage for a southern railroad. If the 90,000,000 acres of cut-over pine lands of the South were put to growing timber, a tremendous future tonnage would be assured the railroads in the eastern United States.



EDITORIAL

By the Forests We Leave Our Children
Will Judge Us.



Action

The Sixty-eighth Congress of the United States convened on December 3. It will be called upon to consider a great variety of important legislation, among which is the enactment of a law establishing a forest policy for the nation. No other legislation, new or pending, is more urgently needed or of more lasting importance to the welfare of the nation. Immediate action is imperative. Public sentiment *favours* it, but Congress will not act until public sentiment *demand*s it. Now is the time to write your Senator and your Congressman and demand his support of constructive forest legislation. Write today and enlist your friends to do the same.

Forest Perspective

CUTTING our virgin forests with no idea or conscious effort of conserving or making use of the growing power of the soil for forestation is at the bottom of our present forest troubles. The evils of that course and the need of toning up our whole anatomy of wood production are today good news copy. Never, in fact, has the forest problem received publicity comparable to that now being given it by the daily press and by popular and technical periodicals. This publicity is of all varieties, ranging from the planting of a single tree, accompanied by staged ceremonies, to the planting of a thousand-acre tract by the government or a state.

The educational value of this publicity cannot be minimized. Public opinion is molded largely by what the public reads, and the daily press, numbering upward of thirty million newspapers every week day, is the greatest molder of public opinion in the nation today. But miscellaneous publicity, dressed to enhance its news value, and thus often losing its proper proportions, is not without its dangers. Today the man on the street, who knows nothing or little about the forest problem, or how it affects him, his state, and his nation, is often confused and misled as to the essential needs of the forest situation. He fails to get a proper perspective of the problem and its solution because he cannot give proper proportion to what he reads.

An outstanding example is the opinion, quite often expressed by the layman, that, "judging by the amount of reforestation reported by the papers," we are comfortably taking care of our forest needs. Nothing is further from the facts. While it is true that more forest planting is being done today than ever before, it is in the aggregate a mere drop in the bucket compared to what should be done to close the widening gap in our forest resources. The big outstanding need is wood for the nation—today, tomorrow, and a hundred years hence. The planting of roadside, shade, and memorial trees is a fine thing and worthy of encouragement in our children, but all should understand that such planting does not serve to stop the great gaping hole in our wood-line. We Americans have always planted trees to beautify our homes and our streets, and we will continue to do that without much exhortation.

What we need and what our children need most of all are trees growing rank upon rank—forests. It is the for-

est from which we will get our wood, our paper, our birds, our wild animals, our wild flowers, our water, and our health-giving recreation. That our forests today are passing rapidly into the limbo of dreary cut-overs, despite all that is now being done, no well informed man will deny. Possibly the best index of how far short our present efforts and present progress really are is in the fact that the annual drain on our forests is today twenty-six billion cubic feet, while our annual forest growth is but a scant six billion cubic feet.

What is being done to offset that inevitable ratio of depletion may be briefly summarized under the three heads of conservative cutting of forests, fire protection, and planting. Forest management for continuous forests in America is confined principally to federal and other publicly owned forests. These areas amount to about 20 per cent of our total forest area. To be added to these is an undetermined acreage which within recent years lumber companies, paper companies, and woodlot owners have placed under some form of management—an area which will probably not exceed 2 per cent of our forest land.

Seventy-nine per cent of our forest land is in private ownership. Today there is being spent to protect it from fire approximately \$3,300,000, of which the states and Federal Government provide two-thirds. Over 166,000,000 acres of private forest holdings are receiving no protection whatever, while on many of those areas where some protection is afforded it is wholly inadequate. In short, we are giving our forests only about one-third the fire protection they should have.

Forest planting has as yet played a very minor part in timber production in the United States. The Federal Government estimates that to date a total of about one and a half million acres have been planted, chiefly by farmers and owners of estates. Compared to the ten million acres and more which are cut and burned over annually and the 326 million acres of cut-over lands which have accumulated as the result of past lumbering, our planting progress appears almost negligible.

This is the picture to which the public must have its attention directed and held. Until that situation is clearly seen and understood by the layman and carried in his mind, public opinion will be incompetent to deal with the problem in a constructive and equitable manner.

The Ranger's Wife

JOSEPH CHOATE once expressed his great admiration for the Pilgrim mothers because, besides enduring all the hardships and danger the Pilgrim fathers endured, they also had to endure the Pilgrim fathers. Without meaning to imply that forest rangers are difficult husbands, we do want to say that rangers' wives have their own peculiar hardships, greater indeed than those of their menfolk; for to these women of the mountain forests belongs one of the worst of all burdens, the burden of loneliness.

Who does not know the glamour of the forest ranger's life?

"He is blooded to the open and the sky.
He is taken in a snare that shall not fail."

He has youth and strength; he knows the inviting mystery of the wilderness, the loveliness of mountain meadows, the cheerful circle of the firelight walled in by the deep shadows of night, and the peace that comes from the ancient music of the pines. With a good horse under him and the long trail ahead, he is lured on by whatever it was that lured Ulysses and Jason.

Meanwhile the ranger's wife is at home. After the first baby comes, she must largely give up traveling with her husband. Being maid, cook, nurse, and general assistant to her husband, she soon finds herself caught in the unescapable circle of routine and confined isolation. If she is lucky, she may have a neighbor a few miles away; if luckier still, she may live in some mountain hamlet where there is a church, a school, and a handful of people. But usually there is loneliness—too much of it—and toil.

The ranger's wife lives in a two, three, or sometimes a four room house, built usually of rough boards or logs

and with the most meager conveniences, if any. Most ranger stations have neither bathrooms nor running water. We have in days gone by seen the forest ranger, with his wife and children, living in a one-room cabin, which had to serve also as office—necessity forcing all to sleep out under the pine trees; for the men who sit in Congress have written into the law that not more than \$1,000 can be spent on any Forest Service building. Of this picayune policy the ranger's wife is the chief victim.

Cooking, sewing, caring for the children, helping her husband with his letters and files, sometimes in emergencies fighting forest fires, the ranger's wife bravely sets about making a cheerful home out of meager and unpromising materials that would daunt the overcivilized woman of the cities. And in general she succeeds, as many a pleasant ranger station shows.

Those who have been reading the stories of the rangers' wives, as published currently in *AMERICAN FORESTS*, cannot fail but admire the splendid courage and devotion of these women, who are giving their lives to the cause of the people's forests.

Is it too much to demand that the United States Government give these women better houses to live in, and their husbands more adequate salaries? For it is hard enough to endure the burden of loneliness without having also to endure poverty and isolated toil. Is it right for a great government to say to a woman that because she is the wife of a forest ranger and is giving her best to the protection of its forests, she shall not have a home on its domain which costs more than \$1,000?

All honor and all justice to these women, who in spite of such drawbacks still love their forest homes, their mountains, and their husbands!

Alabama

IN OCTOBER the legislature of the State of Alabama passed a comprehensive forestry law, backed by real appropriations, and Governor Brandon signed it. Not since 1917, when Louisiana appointed a State Forester under existing law, has any other Southern State provided for a forestry department.

The Alabama lumbermen, both inside and outside of the legislature, "put across" the new law. To be sure, the Federal Forest Service gave valuable aid in framing its provisions, and the Southern Forestry Congress, whose representatives addressed the Alabama lawmakers during the Fifth Congress, at Montgomery, helped to focus public attention on forestry legislation. But it was the lumbermen who conducted the campaign for the bill, and whose foresight, skill, and determination brought about the legislature's capitulation.

But the lumbermen's interest has not stopped with the enactment of a law. Under its provisions three of the seven members of the self-perpetuating forestry board which will direct the policy of the new state department are lumbermen. The governor's appointees represent companies which are today practicing forestry on large holdings, and in two cases have done so for years. With such men behind him, the State Forester of Alabama will begin work with every prospect of commanding the respect and co-operation of those who own the great forest tracts in his state. And by the same token the lumber industry will be relieved of the twin bogies that have too often affrighted them when forestry legislation has been mentioned in the past. Those bogies are Politics and Bureaucracy!

The President and a Forest Policy

PRESIDENT COOLIDGE favors a constructive forest policy. No other conclusion is to be drawn from his message delivered on December 6th to the Sixty-eighth Congress. Although the President devoted only two sentences, out of an otherwise long message, to our forest problem, those two sentences clearly express his hope that early action will be forthcoming.

"Reforestation has an importance far above the attention it usually secures," declared the President. "A special committee of the Senate is investigating this need, and I shall welcome a constructive policy based on their report."

That the President did not express himself more fully or emphasize more strongly the need of immediate action on national forest questions is naturally a matter of regret to many conservationists. We believe, however, he implied as much by his reference to the Senate Reforestation Committee, which has just completed the most exhaustive series of public hearings on forestry ever held in the United States. The report of this committee will soon be presented to Congress. President Coolidge apparently means to leave to the committee specific recommendations as to the form and extent a national forest policy should take at the present session of Congress. That the committee's recommendations, if of a constructive character, will have his support seems self-evident.

The President of the United States is not alone in anticipating large results from the work of the Senate Reforestation Committee. Men and women all over the country and in all walks of life—for the forest affects every citizen, every industry, every community—are awaiting with expectancy not only the committee's recommendations, but definite action by Congress on the constructive proposals which the situation must compel the committee to make.

The report of the committee has been under preparation during December, and it is to be expected that following its presentation to the Senate a bill will be introduced in both branches of Congress embodying the committee's recommendations. In anticipation of this bill, other proposals for forest legislation are undoubtedly being withheld. It is to be hoped that the bill in question will provide for a federal policy of broad and constructive scope—a Magna Charta of American forestry—behind which all interests can throw their strength. The President's support will help immensely, as will that of the Senate committee; but let us not delude ourselves. Nothing short of the most aggressive support by the people, the industries, and the organizations of the United States will, during the present session of Congress, achieve the success of this or any other forest measure.

Enlarge the Superior Forest

THE Superior National Forest of Minnesota should be known to every American who loves to dip a paddle, who thrills at the sight of wild game, or who glories in the possession of good green timber sinking its roots into the soil. There one may travel by canoe day upon day and never recross his course, slipping from one lake to another, an endless chain of water-courses with tree-lined uninhabited shores. It is the greatest remaining canoe country unspoiled by civilization in the United States. It is a great game country, and, best of all, it is the property of the citizens of the United States, "to have and to hold," for the production of timber—an insurance against a rainy day, foreshadowed by clouds of impending forest shortage.

But the Superior Forest is in one of the worst fire belts in the United States. Despite its thousands of acres of water area, its fire hazard is very high. This hazard is higher than is necessary, because the forest is divided, and its different parts are interspersed with private land, which is either given no fire protection at all, or very inadequate protection. Thirty-two per cent of the areas within the boundaries of the forest are privately owned. During the fire season these unprotected areas, like a hanging sword of fire, menace the publicly owned and federally protected forest areas. Remember, the Superior National Forest is in a belt where hundreds of thousands of acres of forest growth may be fire-swept in twenty-four hours. The Superior Forest must be made fireproof against such a tragic catastrophe.

A step to accomplish this very thing has been initiated by the Superior National Forest Recreation Association.

That the fire hazard mentioned may be removed, and that the boundaries of the forest may be more in keeping with its timber-producing possibilities, this Association is sponsoring a bill in Congress to authorize the Secretary of Agriculture to examine and locate for acquirement any lands in private ownership, within or adjoining the Superior Forest, provided they are chiefly valuable for timber-growing or for stream-flow protection. The Association points out that private ownership of cut-over lands, within the boundaries of the forest, invite settlers into sections which tempt modest farming, but that there is little or no agricultural land to be found in the region encompassed by the proposed boundaries. These settlers, who try to make the most of meager agricultural possibilities, it contends, are a serious fire menace at all times to the whole region. It believes that agricultural attempts should not be forced because the region is almost exclusively of timberland type, and its greatest service to the nation is the production of timber and the preservation of one of the greatest water and forest wonderlands in the United States.

Proper protection of the Superior National Forest is a national, and not a local, issue. A bill to provide for its enlargement and better protection should have the support of every American. To read in our paper some fine morning that the Superior National Forest had been devastated by a fire like the great Hinckley, Cloquet or the Moose Lake fires would be to read of a calamity irreparable in one hundred years. It must not happen. Let us prevent it by demanding that the forest be made fireproof so far as is humanly possible.

The Tale of a White-tailed Squirrel

How the Grand Canyon of the Colorado, Centuries Ago, Rent Asunder
His World and Marooned Him on a Lone Mountain

BY WILL BARNES

A FEW years ago, while riding through the yellow-pine forest on the wonderful Kaibab Plateau, in northern Arizona, my eye caught a sudden flash of white among the pines. It was as brilliant and elusive as the dancing light of a small mirror in the hands of a mischievous boy. It was here and there—now still for a second, then chasing away over the carpet of pine needles, to be lost in the masses of trees, like a veritable will-o'-the-wisp.

I had been looking for this very flash of white for several days, for it was the gaudy signal that showed the presence of one *Sciurus Kaibabensis*, the beautiful Kaibab squirrel, found nowhere else in the world except on this singular vegetative island in the midst of a vast desert sagebrush sea, cut off from the rest of Arizona by that monster watercourse, the Grand Canyon of the Colorado River.

Off our horses we tumbled, eager to get a closer view of this forest beauty. We marked the tall yellow pine up which he had slithered in a sort of corkscrew process that made his progress a matter of "now you see him and now you don't." When we reached the base of the tree he was not to be seen. Round and round it we walked, sure he was there, but unable to locate him.

Then a wandering breeze swept through the tree-top and we caught a flash of fluffy white away up toward the top, where the clever little rascal had flattened out on a limb just large enough to hide his fat little body. But for the fluffing out of that beautiful white tail, whose vagaries in the wind he could not control, we might never have discovered him.

The climber of the party immediately started up the tree. The end of a long piece of small rope was tied to his belt for use in pulling up a camera with which we hoped to get a picture of the elusive little native. But *Kaibabensis* didn't propose to be photographed, for when the climber approached, he crept out to the extreme end of

the long limb, poised there a moment, and then, with a quick daring leap and a saucy flirt of his white tail, he sprang across an open space into the sheltering branches of another pine. There we lost him in the dark-green foliage of the forest canopy.

I had "met up" with Kaibab's half-brother, *Sciurus Aberti*, many years before, in his haunts in the yellow-pine forests of northern Arizona, but on the south side of the Grand Canyon of the Colorado River. *Aberti* himself is not without attractions and until his half-brother, *Kaibabensis*, was discovered on the north side of the Grand Canyon, he easily held the place at the head of the list of beautiful squirrels.

Here, in the San Francisco Mountains, near the present town of Flagstaff, Arizona, *Aberti* was discovered, away back in 1851, by Dr. S. W. Woodhouse,

while attached to the Sitgreaves Expedition, which in that year explored a part of northern Arizona and New Mexico. Originally, Dr. Woodhouse called this squirrel *Sciurus dorsalis*, but later on found the name *dorsalis* already taken by another naturalist in describing another squirrel. So he rechristened it *Sciurus Aberti* in honor of Col. J. J. Abert, Chief of Topographical Engineers, U. S. Army. Colonel Abert was not only a brilliant army officer, but also a most capable botanist,



A PET ABERT SQUIRREL, VERY MUCH AT HOME.
HIS LARGE, BRIGHT EYES AND LONG, TUFTED EARS
MAKE HIM PARTICULARLY ATTRACTIVE

geologist, biologist, and general all-round scientist.

It was many years later, in 1903, that another government exploring party, prowling through that part of Arizona lying on the north side of the Grand Canyon, discovered *Aberti's* half-brother. John Stewart, one of the party, collected and sent to Washington several specimens of the new squirrel, which Dr. C. Hart Merriam, the well-known scientist, described as a new species and called *Sciurus Kaibabensis*, from the Kaibab Plateau.

On the high mountain plateau, forested with beautiful pines, firs, spruces, and balsams, but cut off on one side by the Grand Canyon and surrounded on the other three by inhospitable deserts, across which no tree-loving squirrel would dare venture, *Kaibabensis* has lived, isolated from all his kind, for who shall say how many centuries. Scientists feel quite sure that ages upon ages ago before the great gorge of the Colorado was begun there was but one type of these charming little animals. Gradually the canyon deepened and widened, and a day came when, although each could sit in the topmost branches of giant pines on the edge of the canyon and possibly see one another, they could get no nearer.

Then that peculiar thing we call environment began to assert itself. Shut off from all intercourse with other squirrels of any kind, *Kaibabensis* began to develop new characteristics and colorings. *Aberti* has a snow-white belly; *Kaibabensis* has a black one, with a few white hairs scattered

through the fur. *Aberti's* ears are quite black; those of his half-brother are red. *Aberti's* tail is only edged with white, with a broad black line down the center, while that of *Kaibabensis* is much larger and, except for a tinge of black at the point, is a dazzling white. Both have large tufted ears, the hairs in some instances over an inch and

a half long—a characteristic no other known American squirrel possesses.

Describing the differences in the two animals, Dr. E. W. Nelson, of the U. S. Biological Survey, in his wonderfully interesting volume "Smaller Mammals of North America," makes the following statement:

"I have repeatedly noted the effect of changing environment in modifying the animals subject to it. In the present case the change in the squirrels on the north side has evidently been brought about by that powerful factor in evolution known as isolation. Cut off from their fellows by the deepening canyon of the Colorado, Kaibab squirrels have occupied a forest island ever since, with the resulting change in characters we now have in evidence."

Unfortunately for *Kaibabensis*, his beautiful white tail has undoubtedly made him a target of wanton hunters, for although living in a region very difficult to reach and which up to recent years has had but few visitors, he seems not to be holding his own. For the last eighteen years the whole plateau on which he lives has had the protection of a Federal game preserve, as well as being included in the overlapping Kaibab National Forest, policed by Federal Forest Rangers, who jealously protect game animals of all kinds.

In spite of this long period of protection, men well acquainted with the plateau declare he is certainly not increasing and perhaps is actually becoming scarcer. Many people believe he is the victim of



A BACK VIEW OF KAIBABENSIS AND HIS HALF-BROTHER, *SCIURUS ABERTI*, SHOWING THE MARKED DIFFERENCE IN THE TAIL BROUGHT ABOUT BY CONTROLLING ENVIRONMENT IN THE KAIBAB SQUIRREL

predatory birds, such as hawks and owls, although there are very few instances on record where such birds have been actually seen attacking the squirrels. Sheltered as the squirrels are in the heavy timber, it seems unlikely that birds of this kind could capture many of them. Other students of the matter suspect that some disease may account for their lessening numbers.

Efforts have been made to capture a few squirrels, to be removed to some other part of the country, in the hope that by this means the species will be saved from total extinction, if that be likely. They are extremely difficult to capture, however, and so far not a single pair has been caught.

The little rascals are very clever at concealing themselves. Time after time I have seen that long white tail flash up the trunk of a yellow pine, but found myself unable to locate him. They simply spread themselves out perfectly flat on a broad bough, where they seem to merge into their surroundings so completely as to escape discovery, unless one starts to climb the tree. What a vocal racket they then set up against the intruder. They bark and scold away like the large fox squirrel, but when crowded make their way to the ends of the limbs and jump into an adjoining tree; or, according to Dr. Nelson's observation, will spread their legs and sail away into space, landing with a sounding thump on the ground with apparently no serious consequences, as far as their ability to scramble out of sight is concerned.

From general observation of their habits, these squirrels are always ready to take advantage of hollow trees or large knot-holes for their nests; yet, according to Dr. Nelson's keen study of them, they sometimes build large nests of leaves, pine needles, and twigs, lining them with soft grasses and shredded bark, in the topmost branches of the tall pines.

Every possible effort is being made to protect this most beautiful of all squirrels from extinction. In an endeavor to make this protection as efficient as possible, Dr. William T. Hornaday, the veteran wild-life lover, offered to supply each Forest officer on the Kaibab Forest with a shotgun, with which to wage a war of extermination against the hawks that

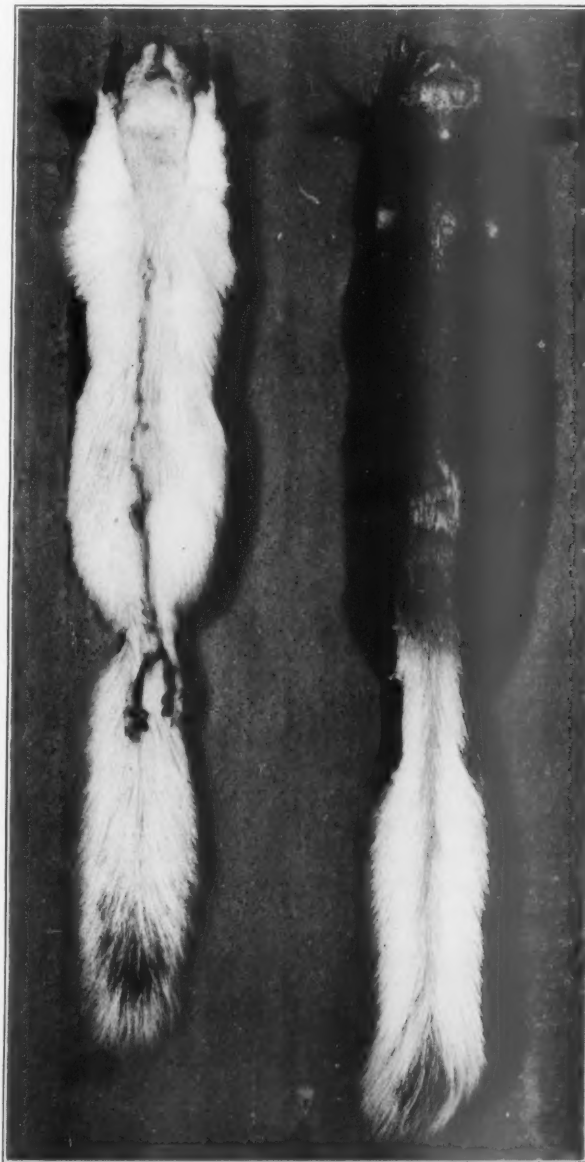
some people claim are doing much damage to them. This claim, however, cannot be substantiated.

So far as is possible to determine, this squirrel has always had a good supply of food much to his liking. If the pines in which they spend most of their lives do not produce a good crop of seeds, they have to make but

a short migration to the steep slopes of their plateau, where are several kinds of oaks and the piñon pine to serve them well.

With the building of a fine auto road from Utah across the strip into this remarkable region, the Kaibab squirrel and his lovely bushy tail are bound to attract more attention and admiration than ever. Together with some twenty thousand mule deer which inhabit the forests adjoining the auto road leading to the canyon's rim, they furnish an added attraction to the tourist who takes the northern route to that most wonderful of all wonderful gorges, the Grand Canyon of the Colorado River.

The home of the Kaibab squirrel—the Kaibab plateau—was named by that celebrated government explorer and all-round scientist, Major Powell, more often referred to as the "discoverer of the Grand Canyon." Powell, in his trips through and along the canyon, named many of its topographical features, and among them this plateau, which he called Kaibab, for a small and today almost extinct tribe of American Indians of the Piute family, who lived in that region. The name, according to authorities, means "Mountains"—derived from their word "Kaib" with the locative



THE UNDER SIDE OF THE TWO SQUIRRELS. WHILE *ABERTI* HAS A SNOW-WHITE BELLY, *KAIABENSIS* HAS A BLACK ONE, WITH A FEW WHITE HAIRS SCATTERED THROUGH THE FUR. *ABERTI*'S EARS ARE QUITE BLACK; THOSE OF HIS HALF-BROTHER ARE RED

"ab" (on the mountain)—undoubtedly referring to their habitat "on the mountain."

This remarkable plateau or tableland stands out boldly from the north side of the canyon directly across from the railroad head at the Hotel El Tovar, located on the very edge of the south rim of the canyon.



A TENT RANGER CAMP

Why Is a Forest Ranger's Wife?

BY MARIE WAITE McCONNEL

I ONCE heard a lengthy discussion among a group of Forest Rangers as to the exact official status of the Forest Ranger's wife. I think the conclusion finally reached was that she should be classed as "personally owned equipment!" To that verdict I shall add an adjective—indispensable! In fact, next to a reliable pack-horse, I think a wife is the most essential article in the Forest Ranger's outfit! The Government should insist that prospective Forest Rangers furnish wives, along with other required equipment!

In support of this contention, I submit an example of the heroic work Mrs. Ranger does in the preservation of life, to wit, keeping smudges going, without which the steel-billed mosquito and the bucket-bailing horsefly would speedily demolish the ranger's trusty pack-horse. Of course, the Forest Service husband usually hauls up a kindling log, as the cornerstone of her domesticity, before starting on one of his trips of unknown length; but other than that, the honors are entirely hers.

Passing over her ordinary tasks of chasing chipmunks out of the bread can, defending pet fool hens from depredation, providing *beaucoup* provender for the Forest Ranger, his fire guard

assistant, and his numerous dogs, keeping up with the topics of the day *via* the telephone—this latter is important and consumes a great deal of time—I must not fail to mention her most important duty, which is satisfying the insatiable curiosity of summer tourists as to—no, not "What does the crocodile have for dinner?"—but "What does a Forest Ranger do in the winter time—no fires?" But why go on? Almost before the introductions are over I can see that feverish glitter of the eye that tells me what is coming. Sure enough, my new acquaintance sidles up and with a mighty effort out comes the fated question. Were my response that of Mr. Kipling's crocodile, how many lengthened proboscis(es) there would be!

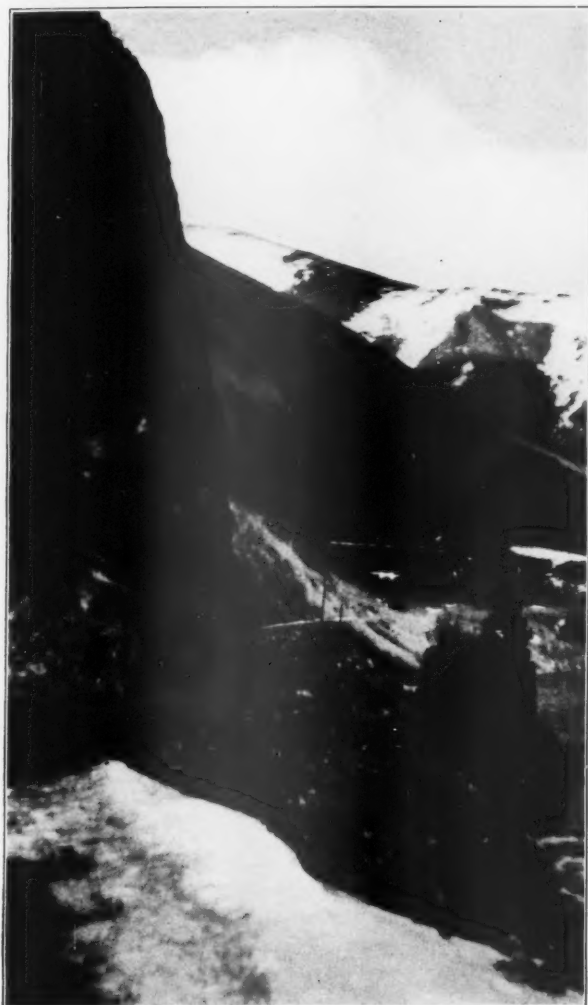
The habitat of the Forest Ranger's wife may be defined as "ranger stations and vicinity." Now, a ranger station may be a conventional house, a log cabin, a shack, or a tent. The tent was our inheritance, the log cabin

having been burned. Well do I remember my first experience in a canvas palace, when I spent most of the night clinging precariously to the ridgepole, while porcupines in flocks and schools briskly whisk-broomed the outer walls!

The ranger's wife who happens to be sta-



THE ARRIVAL OF THE OCCASIONAL PACK-TRAIN BREAKS THE MONOTONY



"ALL NATURE LIES BEFORE HER VERY EYES"

tioned out near civilization leads more the life of the ordinary farmer's wife. She has her garden, cows, and chickens and takes her part in the life of the community. Not so her sister of the "mountain fastnesses," especially if she be one of those whose official headquarters changes with the seasons. It is of the latter I shall speak.

The furnishings of her cabin are usually crude, namely, a log bunk with the ponderousness of a billiard table, shelves, a table and chairs, often of lumber whip-sawed by the ranger; a screened cupboard of the same lumber, an essential in our locality at any rate, because of the friendliness of the kangaroo mice. The Forest Service furnishes her dishes, cutlery, cooking utensils, and a diminutive stove, which she cherishes as a jewel beyond price.

Immediately I hear some one exclaim, "Oh, you don't cook on a camp fire?" I am content to allow my camping friends the flavor of their camp-fire cookery. When cooking for two hun-

gry men and the afore-mentioned dogs, I find the romance soon fades and one day's delicious flavor overbalanced by next day's scorch. One slides a pan of biscuits in the oven with a heartfelt sigh of relief that there are no coals to shovel and no lifting on and off of a heavy Dutch oven, no danger of a wind coming up that burns one side while it leaves the other raw.

Personal belongings are few, being no more than can be moved on a pack-horse. Here again the delighted public exclaims, "But what a wonderful opportunity for reading and study you have—no housework to speak of and little cooking!" Transportation of supplies, bed, and the essentials in clothes leaves little room for books on the two pack-horses. Here is a new field for some progressive library. Now that the book wagon is an accepted thing for the agricultural woman, who will be the first to fit out the book mule for the Ranger's wife?

An overly gregarious woman would lead a miserable life here, although there is the telephone, and an occasional pack-train now passes the trail. As a general thing, during "field season"—from early spring to late fall—the Ranger spends very little time at headquarters. His ordinary work takes him on inspection and construction trips of indeterminate length, with fire suppression in addition. Of course, it is sometimes possible for the Ranger's wife to go along, unless she has a switchboard to attend to, but the trips are hard, and after the first few she usually elects to remain in camp.

My first day thus alone I spent entertaining a feeble-minded (but harmless, I have since been assured) camp-follower who answered to the euphonious title of "Wyoming Ape." My morale was so weakened by the encounter that thereafter I always appropriated the venomous-looking .45, which later caused me great embarrassment. On that occasion I had observed a stranger approaching and hastily crammed the artillery into an inadequate pocket before stepping out of the tent. He proved, not a second "Ape" or a villain with designs dire, but a benevolent old prospector, from some twenty miles



"SORRY; GOTTA GO"

over the mountain, who had dropped in to pay his respects. The pocket being small, I was obliged to keep a firm grip on the gun to prevent it from falling out. My visitor politely overlooked my seeming suspicions, as I held him with a glassy eye while I secreted the cannon under a corner of blanket.

There is a serious side to this life, too, which is never realized by those who think of it only as a life of pleasure—a daily round of fishing, hunting, and hiking about the mountains. But other people always have queer ideas. They don't stop to consider the uncertainty, the strain, the lonesomeness, under which the Ranger's wife lives. Not only after big storms is there that agonizing suspense, when no word can come over the telephone lines, and the worst may have happened to the absent husband. The ordinary life is filled with hazards at its best. A falling tree, a horse that stumbles on a treacherous trail, a bolt of lightning—these are things a Ranger's wife does not care to dwell on.

Sundays and holidays are not exempt, if there is work to be done. Telephone lines must be kept open, fires must be suppressed as soon as discovered, no matter what the day or hour, and next day—work as usual. One fine Sunday a little fishing trip is planned. About twenty minutes before you're to start, there's sure to be an ominous silence.

"I haven't heard that phone ring all morning, have you, Mary? Thought so; grounded somewhere. It may be a mile away or it may be twenty. Sorry; gotta go!" And your Ranger husband is gone and so is your fishing trip.

This repeats itself with countless variations. The next Sunday being a wedding anniversary, you plan a special dinner, with a boiled bean and no-egg-limit menu. Dinner is hot on the table. The phone rings. You get to dread that ring, especially after a storm.

"Are you sure?" megaphones the Ranger. "All right; I'll be on my way." Then you know what's coming.

"Make me a sandwich, Mary, while I saddle up, won't you? No, I can't wait to eat dinner. That fire's been burning for two days; isn't even on our forest, but the fool lookout just picked up the smoke and undershot the distance. Still, might be a fire on a line with that one now. Gotta go!" And you dine in state—alone, with twenty miles of mountains looking down upon you from all sides.

To offset this, for the Ranger's wife with eyes of understanding, there is before her the glory of all outdoors. Black squirrels whirr like excited alarm-clocks in the trees above her; chipmunks demonstrate champion light-weight tactics in defending their favorite oatmeal sacks from invasion; porcupines trundle morosely along, like armored tanks, clicking and rustling when disturbed by an investigating dog; fool hens chuckle contentedly at her very feet, and there are occasional glimpses of the shyer swift-footed creatures—a curious-eyed deer, a mink, or perhaps a furry blur of fox.

All nature lies before her very eyes, which have no man-made distractions to divert her gaze. Her pleasures come from simple things—to watch a gnawed rind of sun linger irresolutely on a mountain tip, then disappear, and harsh, snow-pocked hills press nearer, and then grow less forbidding behind a veil of friendly amethyst. Massive rocks, with battlements and turrets, gleam mistily in the river's clear depths—dream castles crystaled in a shadowed emerald. Overhead rear lofty pinnacles, Thor's palace, from whose towers are hurled his mighty thunderbolts.

Nor is there only harsh grandeur for her eyes. A crescent pool, adream with golden water lilies; the tender mauve of smoky willows in the soft spring rain; a flash of sun—they change to misty olive, tipped with ocher. A cliff, its tiny waterfall, that covers the time-worn, wrinkled rock with folds of velvet moss and priceless, foaming lace! How does that compare, ye city wives, with the view from your north windows—the apartment house across the way?

THE ARKANSAS RANGER

The Oregon Ranger looks at a stranger
As though he were something new;
The Sierra Ranger makes light of the danger
That lurks in his Mulligan stew;
But the Arkansas Ranger must chase him a granger
Every morning while the day is yet new.

The Trinity Guard has work that is hard,
As he wrestles with pickaxe and shovel;
The Angeles Guard stands firm on the sward,
While ferninst him the homeseekers grovel;
But the Arkansas Guard leaves his own house yard
In a daily search for the wood-burner's hovel.

You sing of your canons and rivers so wide;
Of snow-covered peaks that are ever so high;
Of brown-faced, leather-chapped rangers who ride
Out where the mountains reach up to the sky,
With often a word that might be meant to deride
Those who put out ten fires with never a sigh.

But give me the man who'll take his foot in his hand
And go looking for fires every day,
Without a word of reproach as he takes up his stand,
Down where the dear little firebugs play.
You may take all of the men Greeley has in this land,
And the Arkansas Ranger will show 'em the way.

—Charles V. Brereton.

A Dream Coming True

By JOHN D. GUTHRIE

OUT in Harney and Grant counties, Oregon, the talk for the past forty years has been of cattle and horses, of sheep and alfalfa. And where are Harney and Grant counties? you may well ask. They are big frontier counties lying in central Oregon. With a little care, Vermont and Connecticut could be tucked comfortably within their boundaries; there are several ranches in these two counties as big as Rhode Island. Harney County is just about the size of Maryland. Burns, a town of some 1,500 souls, is a sort of community center for that region. Burns is 28 miles west of Crane, which is at the end of a little branch railroad that runs off westward 127 miles into space from Ontario; and Ontario is on the Snake River, on the line between Oregon and Idaho, 434 miles by railroad from Portland on the west and 316 miles from Ogden, Utah, on the east.

The men in Grant and Harney counties have always worn Stetson hats, woolly "chaps," and spurs. The country is the kind that when you are in it you realize that there are such things in the world as stars, sunsets, and sunrises. You can look east and south and southeast for hundreds of miles. To the north you look up towards the Blue Mountains—blue because when the pioneers first saw them from afar to the east, on the Snake River, they ran like a deep blue line on their west-



COWMEN, WITH WOOLLY "CHAPS," STETSONS, AND SPURS

ern horizon—mountains whose green, when seen through the distant haze of the western sky, turns to blue. These mountains were then, as now, covered with stately pines. These selfsame trees were guarding the heights when the first white men came—when Lewis and Clark, and then Whitman and McLaughlin, came looking out the land. These old yellow pines, with their bronzed bodies, have been mute witnesses to much history making. They were there for hundreds of years with the red men; they were there when the white man came; they are there now. They were a part of the scene—as much a part as the rugged peaks, the rolling sagebrush-covered hills, the great green meadows to the south, where numberless waterfowl have made their homes for centuries.

White men came and saw it was good and remained in the country. Some of the far-sighted ones said, "Some day this timber will be felled and be built into homes." They said, "Some of the water in the Malheur River, in North Fork, in Silver and Hay and Emigrant and Silvies creeks is going to be put on some of this fine land some



"THE COUNTRY IS THE KIND THAT MAKES YOU REALIZE THERE ARE SUCH THINGS IN THE WORLD AS STARS, SUNSETS, AND SUNRISES. YOU CAN LOOK EAST . . . HUNDREDS OF MILES, AND TO THE NORTH, UP TOWARDS THE BLUE MOUNTAINS, THEN AS NOW, COVERED WITH STATELY PINES"



ROADS THAT LED OFF INTO SAGEBRUSH AND SILENCE

day, and there are going to be homes here." Others said the timber was a detriment to a cow country; the young pines were ruining the range and ought to be burned off every year or so. The years passed. The sagebrush grew more silvery as each winter came on, and turned a bit greener as spring came up from the south. The jack-rabbits still loped across the flats, but the great bands of antelope that used to dot the open country passed over the ridges out of sight. But cattle and sheep fed on the lower country during the winter months, and were driven up or followed

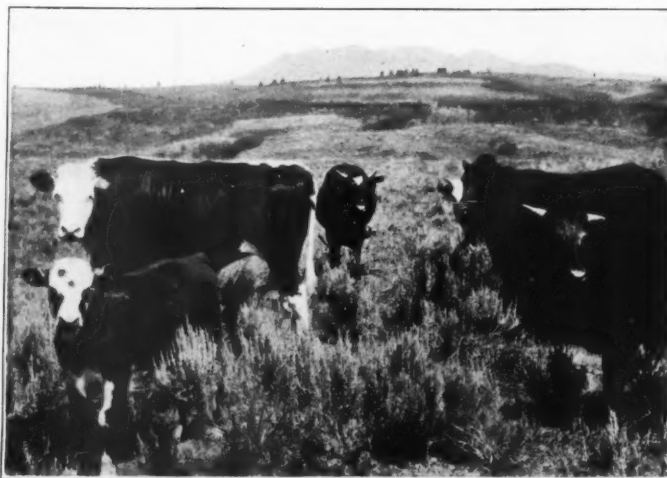
the snow-line up into the pine forest in the spring. This region began to be called "the meat-platter" of Oregon.

In the higher country, from 4,000 to 6,000 feet above sea-level, the trees grew to maturity and scattered their seed to the winds, and declined and died and fell, and young trees sprang up to take their places. Lightning leveled some; beetles from time to time took their toll; fire, set by the red hand first, and later by a white hand, took its share. But the rain, the soil, and the sun did their share and the forest thrived.

Some Forest Service men, along about 1903, rode over the country, made a report and recommended that most of this timbered country be set aside as the Blue Mountains Forest Reserve, for the growing of timber and the protection of water-flows. Then, in 1907, one T. Roosevelt proclaimed it a forest reserve, and on July 1, 1908, it was rechristened the Malheur National

Forest. The people in the country then thought it was mighty foolish, and thought more so as time went on, for they couldn't see that the trees were doing any better than they had before, nor were the water-flows any different. Then the forest rangers came in and rode with the cowmen and the sheepmen and talked about fighting forest fires and protecting the timber for future generations.

Then a great war came to the world, and Grant and Harney counties sent out their sons, along with millions of other sons, to fight in foreign lands. A change gradually came over the country. These trees that had been growing into beauty and usefulness for hundreds and hundreds of years began to have more value to build houses out of. Some men said they believed it would pay to get this timber out where the people were who wanted to use it.

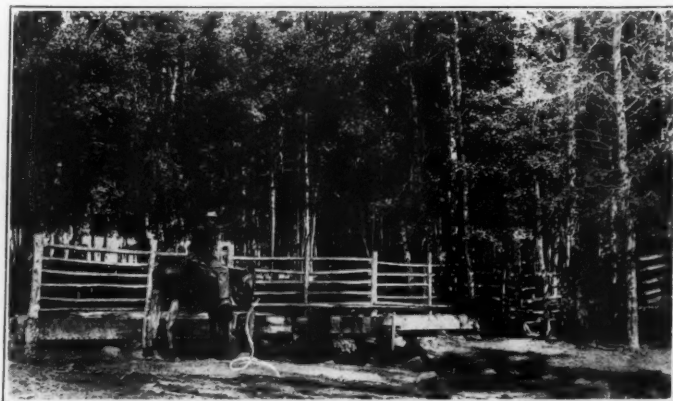


CATTLE FOLLOWED THE SNOW-LINE UP INTO THE PINE FOREST IN THE SPRING. THIS REGION BEGAN TO BE CALLED THE "MEAT-PLATTER" OF OREGON

that these pine trees were sound and of good quality; that they were, for the most part, mature. The trees,

Then the Government, through its Forest Service, which had by now come to be accepted as a part of the natural order of things, so to speak, saw that the time had come when it could take a hand in helping develop that country. And so the forest rangers examined this beautiful pine forest, measured it, mapped it, and decided that here was a fine body of timber that had been growing more valuable all the time, ready now to be made

use of. They found



FROM A SPRING IN A LITTLE COTTONWOOD GROVE THE COWMEN HAD PIPED THE WATER INTO TROUGHS FOR THE STOCK

they reported, would average four and one-half sixteen-foot lots in merchantable length, and would run about five logs per thousand feet, log scale. And, speaking further in the language that the lumberman would understand, they reported that this pine would yield between 25 and 30 per cent of shop and better lumber and over 20 per cent of No. 2 common.

They figured that there were some 890 million board feet of this timber on some 67,400 acres lying at the head of Silvies River, in a broad basin known as Bear Valley, that should be harvested; that tributary to Bear Valley there were seven billion feet more; that there were enough trees here so that fifty million feet could be cut each year forever, provided some young trees were left and some old trees permitted to stand to scatter their thousands of seeds, and provided always that the demon fire was kept out. They figured that here was a place for a lumbering operation that could last indefinitely; where a sawmill could be put up to run forever; where houses and schools and churches could be built, and these could stay there and not have to be torn down or abandoned at the end of ten years or twenty years. Here were going to be changes where *homes*—not merely houses—could be built and children could be reared and educated and have a chance to live their lives. And it all was going to be possible by realizing



NEAR THE EDGE OF THE TIMBER THE WHITE TENT OF A SHEEP HERDER SHONE



WHILE HIS SHEEP GRAZED IN THE OPEN



THE STOCKMEN COMPLAINED TO THE RANGERS THAT THE YOUNG PINES WERE RUINING THE RANGE

continue it, if it were given a chance. And the people of Burns and all that region became greatly interested, for they saw more in the yellow-pine trees now than they had ever seen before, namely, prosperity and progress. The chambers of commerce—for these, too, had now come to this country—held meetings and passed resolutions and sent telegrams and voted money to invite industry to Grant and Harney counties.

The foresters decided that it would be wise to sell a little bit of this ripe timber right now; so they advertised 890 million board feet of it, which would run a pretty fair-sized sawmill for 20 years; and when that was all cut they would sell another block, for they found that there were not less than seven billion feet that could be harvested and carried out to the world by way of Burns. And so the foresters told the outside world about the fine pine forest, the beautiful open valleys, the broad alfalfa fields, the wide sagebrush lands, and how all of this was waiting for a railroad to bring in machinery and people, so the lumber that the outside people needed could be harvested and carried out. People far down in the South heard about this fine pine timber; people in New England and along the Atlantic coast, where there hasn't been any big timber for many years, and in the prairie states of the Middle West, where there never was any timber of any kind. This big body of fine pine timber, with the building of ninety miles of railroad to get to it, and the chance of building



THE TREES WOULD AVERAGE
FOUR AND ONE-HALF SIXTEEN-
FOOT LOGS TO THE TREE

wearers of the Stetson hats, the woolly "chaps," and the spurs began to see that these pines on their hills were worth something after all; that they were going to help build up the country; that the forest was going to bring a railroad to them.

And so the dreams of the old-time settlers bid fair to come true, for a railroad is going to be built up the valleys and into the yellow-pine forests, and

up a *permanent* lumbering operation, which the people in these states had never had, interested them mightily.

And so in the good year of 1923 the mature timber on this first unit or block, as the foresters called it, was sold for \$2.80 per thousand board feet. And the old timers and the

sawmills are to be built, and men will come in, and there will be activity; and some people say it means the passing of another frontier. Rather the talk is to be changed from cattle and horses and saddles and alfalfa to logs and lumber and towns and real-estate deals. New people are going to come in, and schools, churches and movies, and Fords.

The pine forest was going to play the part that forests are always intended to play in the economic upbuilding of communities, if handled rightly. New industry, new business, new life were going to come into Harney and Grant counties, and this harvesting of a timber crop that has been growing for hundreds of years was going to help build more and better schools and roads, for a part of each dollar Uncle Sam receives from the sale of his timber crop each year comes back to the counties to be spent for better schools and better roads, which mean better children and better citizens. And the best part of it is that the forest is going to keep on growing, to yield logs to keep the sawmills running, to keep the schools open, and to keep the roads good.



THE FOREST WAS EASY FOR LOGGING

Woof! Woof! Some Bear Story!

"Charlie is a liar."

"Why do you call him a liar?"

"Because he tells such big whoppers."

"Yes?"

"Whoever heard of a bear turning into a pack animal?"

"Pack animal?"

"Yes; Charlie caught a cub and when he went up to his prospect hole he put the shovels on the cub's back."

"Is that unusual?"

"Well, maybe he could do that, but when it comes to riding him up to the prospect every day, after the bear was grown, it is too much."

"Does he still ride him?"

"I should say not! Last week when he was riding up

to his prospect hole he met two wild bears coming down the trail, and the fight was on."

"Good Lord! Did the bears kill Charlie?"

"No; but after he killed the two bears and tried to get on his tame bear to ride back to his cabin, the bear was sure unruly. It took him half an hour to get on it and 20 minutes to get back to his cabin. When he got off the bear said, 'Woof, woof,' and beat it."

"Wasn't it in the habit of being loose around the cabin?"

"Yes; it had lived there ever since it was a cub. When Charlie got back to the dead bears with his knife to skin them, he found he had made a mistake and killed his pet bear in the mix-up." (We'll say Charlie's a liar.)

National Chamber of Commerce Favors Forest Action

*Organizations Representing 700,000 Business Men
Endorse Program of Forest Progress for Nation*

AS A RESULT of the recent referendum on a National Forest policy, the Chamber of Commerce of the United States stands committed to all but one of the recommendations made by its Forestry Committee after two years of investigation. The substance of the committee's report was published in the November number of *AMERICAN FORESTRY*, page 683. The referendum was taken among the Chamber's underlying organizations and it is said to represent the opinion of 700,000 business men.

All but one of the committee's recommendations were voted upon favorably. The exception was Recommendation No. 5, which advocated that Congress create a National Forest Council to give advice to administrative officials of the Federal Government and the several states. The summary of the committee's recommendations and the vote on each is given below.

I. That the Federal Government should, for protection of headwaters of navigable streams and to the extent permitted by existing law, acquire, reseed, and replant waste lands on which reproduction of forest growth cannot be obtained by natural means, with discretion in the Secretary of Agriculture to prefer lands in states which provide at least an equal amount of funds for acquisition of such lands.

Votes in favor, 1,887; votes opposed, 201.

II. That states and municipalities should acquire, reseed, and replant the remainder of such waste lands.

Votes in favor, 1,887½; votes opposed, 196½.

III. That Congress should enact new legislation with reference to other classes of timberland, to make provision for co-operation of Federal Government, state

governments, and timber-owners in protection and reproduction of timber.

Votes in favor, 1,724; votes opposed, 356.

IV. That such new federal legislation should condition use of federal funds upon the state:

Having a forestry or conservation commission;

Formulating a code of forest management;

Maintaining adequate protection of timberlands from fire;

Basing taxation of growing timber upon the principle of the yield tax.

Votes in favor, 1,556; vote opposed, 523.

V. That Congress should create a National Forest Council, to have functions of advice to administrative officials.

Votes in favor, 1,358½; votes opposed, 701½.

VI. That Congress should provide for a national survey and inventory of forest resources.

Votes in favor, 1,761½; votes opposed, 292½.

VII. That Congress should increase the federal appropriations available for protection of timberlands against fire.

Votes in favor, 1,987½; votes opposed, 98½.

VIII. That Congress should provide for enlargement of federal research and experiment in forest products.

Votes in favor, 1,908½; votes opposed, 164½.

Under the by-laws the Chamber is committed on a proposition submitted to referendum by a two-thirds vote representing at least twenty states, providing at least one-third of the voting strength of the Chamber has been polled.

Girard, A Timber-faring Man of the Mountains

[Continued from page 35]

sales. To handle one hundred men on a fire-line is as easy for him as appraising one thousand acres of timber. Jim usually figured that during July and August he would be working about twenty hours a day on the fire-line, while the rest of the year he would be cruising timber and fixing prices at which Uncle Sam would put his timber on the market.

Girard's reputation as a mountain hiker is practically undisputed. Many a man who has prided himself on his ability to walk endless miles and endless hours in the mountains has had to admit that Jim Girard is in a class of his own. Girard's speed and endurance as a

walker is remarkable. Off into the woods at daylight, he can go until nightfall, seemingly with little effort.

His physical courage and endurance were demonstrated not long ago on a field trip on the Lolo National Forest. After riding all day and until after dark, he made camp and took the pail to go for water. He had to cross a plank over a deep, abandoned mining flume. As he stepped on the plank it broke and precipitated him to the bottom of the flume. His shoulder struck a timber and was dislocated and the nerve of the forearm was smashed and nearly severed. His companion fixed up as good a bed as he could out of boughs and sat up all night

ministering as best he could to the injured man, who suffered constant and intense pain. At daylight he rode 18 miles for help, and it was afternoon when he got back with the doctor. The shoulder was badly swollen and it was necessary to chloroform the patient before the dislocation could be reduced. The average man would have been prostrated after 18 hours of intense pain, followed by an anesthetic, but Girard climbed down off the improvised operating table and walked nine miles down the trail, to the end of the wagon road, refusing to ride a horse.

Girard had an important part in making the timber appraisal in the largest timber sale the Government has ever made, that recently announced on the Malheur Forest in Oregon, amounting to almost a billion board feet. Incidentally that sale turned the course of Jim's life.

Jim and his men fixed the price at \$2.75 a thousand feet, but the Government received no bids when the

timber was put up for sale. Uncle Sam then decided to re-advertise this timber at a lower price, and Jim's feelings were rather hurt, because he knew the timber was worth fully as much as he had recommended. This decision of Uncle Sam spurred him to do something to prevent a sale in which he felt the Government would not be getting full value. Jim knows timber in big terms, and the cost of logging and milling to the *nth* degree. Likewise he knows a lot of timber operators in the Idaho panhandle and he has their confidence; so he ran over to northern Idaho, feeling that he might interest some of the timber operators there in the Malheur timber. He saw just one; and this man, as a dark horse, was later the successful bidder. The man never even made an examination of the timber. He just took Jim's word for it and paid \$2.80 a thousand, or five cents more than Jim had recommended. Thus Jim Girard in three days saved the people of the United States considerably more than his salary during a couple of lifetimes.



THE OPENING OF THE DUCK HUNTING SEASON

As seen by J. N. Darling ("Ding"), of Iowa

Do not think that because ducks and geese have been greatly increased by the migratory bird law, the duck supply is now inexhaustible. Remember the mistake of the Ohio legislature in 1857 on the "millions" of passenger pigeons that "need no protection." Remember the millions of the American bison, fur seal, quail in 1860 and prairie chickens, and stop 50 per cent of the wild-fowl killing.

The Deadly Optimist

By WILLIAM T. HORNADAY

PROMINENT in the list of the enemies of wild life I now place the Deadly Optimist.

For nearly ten years I have known him well. My acquaintance with him began with the Federal Migratory Bird Treaty, which brought him prominently into notice. He may be recognized everywhere by his serene confidence that NOW "the game is ALL right!" He thinks that the migratory bird regulations are the great cure-all. He believes that the pump gun is all right, and should not be attacked; but at times he does rail out against the wicked "automatic" gun. Often, however, that is only so much camouflage for the equally wicked pump gun!

The D. O. does not believe it necessary to make "large reductions in bag limits and open seasons." He thinks "we already have too many game laws!" When you show him pictures and figures of slaughter and slaughterers, he says: "Well, the bag limits are all right—IF they are thoroughly enforced! The game will be all right IF, and IF, and IF"—. When you are discussing game slaughter, anywhere, listen for the "if"; and when you spot the user, you will find a D. O.

The deadly influence of the serene optimists is today incalculable. They are so calm, so dignified, and so judge-like in their addresses to legislative committees that they impress lawmakers who do not know the game of game protection. The most dangerous of them all is the optimistic State Game Commissioner or State Game Warden. In Iowa, in 1917, it took a pitched battle to beat the State Game Warden's opposition to the bill to save the quail and prairie chicken. He was backed by the D. O. sportsmen of Iowa.

Look out for the D. O. He is a drag on real wild life protection, no matter whether he means to be so or not.

Rangers of the North

[Continued from page 22]

away. Succeeded in rescuing Mr. Bell after narrow escape. Beached the boat and recovered tent, bedding, and a few other articles. Lost rifle, all clothing, ax, tools for engine, oars, and all provisions, notebooks, papers, etc. Cached recovered property in trees near the boat and walked to lake, where we found old skiff, in which we crossed to south shore, where there is an old trail. Walked to Ray cabin and camped without food. Mr. Nettleton and Mr. Bell will return for the boat when the river falls again."

"Aug. 3.—Left Ray cabin at 6 a. m. and walked five miles to Steve Melcher's camp for breakfast. Continued up river and reached Bell's camp at lower end of Kenai Lake at dark."

"Aug. 4.—Strong wind on Kenai Lake prevented our crossing today; also prevented the launch *Bat* from making its run to Cooper Landing."

"Aug 5.—Wind continues. Three men came up river today and we all plan on going in to Roosevelt tonight, if

wind subsides. In p. m. the wind died down somewhat, a launch came down from Roosevelt, and we all returned on her, arriving at 5:30 p. m."

Just a few brief paragraphs used to describe what would be to most men an adventure to talk about for years—with these rangers of the north merely a part of the day's work.

The fleet of the Alaskan National Forests consists at present of ten motor-driven boats ranging in size from 22-foot open dories to the 100-foot *Hiawatha*, the flagship. This active little fleet, in addition to regular Forest Service work, is often called on to help other branches of the Federal service and to assist in emergency rescue or police work.

To keep this floating stock in shipshape condition involves no little labor and expense. At Ketchikan, headquarters of the Tongass National Forest, the Service has well-equipped marine ways and shops where all but the most complicated repairs can be made.

Forest Crops as Railway Tonnage

[Continued from page 37]

to show from 500 to 1,000 board feet of wood growth annually.

Intensive forest management can become completely effective only in the course of years; but it must be planned for now, in order to have the crops of second growth ready fifty years from now, by which time it is roughly estimated there will be little left of the old-growth forests in the West. If a start is made now, excellent second-growth forests will be ready for continued operation at that time.

What is done now in the way of reforestation will affect very little the railway tonnage of the immediate future; but, since railways are accustomed to look forward many years in some matters, it should not be difficult for them to see the importance of providing for successive crops of forest products on lands suitable mainly for timber production. From a financial point of view, the problem for the railroads may be stated somewhat as follows: Assuming a period of fifty years to the end of the old-growth timber, certain railways will lose a great deal, if not all, of their value if provision is not made for further crops of timber after the old growth is cut; and, figuring at 5 per cent compound interest, it is reasonable to spend each year, in the way of an insurance premium, \$4,775 to protect each million dollars of rail-

way value which is in danger of being wiped out through loss of forest-products tonnage. If a 40-year period for the exhaustion of the old-growth timber is contemplated, the justifiable annual expenditure per million dollars of value to be protected is approximately \$8,000; if the period is 30 years, then about \$15,000 is justified.

Another matter of importance to a railway is the population per unit of area in the territory served. With intensive forest management in the redwood region, the permanent population dependent upon the forest industry will probably be at the rate of about one person per 30 acres, but if no provision were to be made for reforestation, the population would probably sink to less than one person per 1,000 acres. (The population of Nebraska is now about one person per 38 acres, while Nevada has about one person per 900 acres.)

While some railways, especially those owning considerable areas of forest lands, can profitably engage in intensive forest management on their own lands, it is not advocated that railways generally go directly into the business of growing timber, but rather that they consider very carefully the relation of reforestation to their future welfare and take some of the numerous steps which are practicable to bring about successful reforestation in the territories upon which their lines depend.

DURING the past eleven years the United States Department of Agriculture has spent \$20,435,200 in the construction of 5,950 miles of roads and 8,960 miles of trails within or adjacent to the National Forests. In addition, \$7,446,000 of co-operative funds from states and counties was expended upon this construction.

MATCH manufacturers in the United States consumed \$13,240,000.00 worth of lumber and other products during 1921 in the making of matches. The product had a value of \$30,274,000.00 and 5,800 people were employed. Twenty-two concerns were engaged in match manufacturing.

Making of a Violin

[Continued from page 19]

these two are considered worthy. At any rate, they satisfied the old masters, and moderns are content with emulation without thought of improvement.

That property of wood known as resonance is very intangible. Some woods produce a musical sound when struck with a hammer, as in the case of percussion instruments, such as the xylophone and marimba, while a thin board may be set vibrating and made to give a tone by merely producing a suitable tone in its vicinity. The vibrations of a violin string, produced by the rosined horse-hair of the bow, are communicated to the sounding-board, which vibrates in the same intervals as the string and re-enforces the note. The bridge serves to conduct the power of the strings to the sounding-board, and up to a certain limit the power of vibration, or tone power, increases with the degrees of pressure. It is to insure a strong pressure of the strings that the neck is tilted back. The sounding-board is arched, so that the thin material may be strong enough to resist the string pressure on the bridge. This arching is effected by carving from solid wood and not from bending, in order that every fiber be left in as nearly unstrained condition as possible, and therefore free to vibrate.

Wood, in its natural condition in the living tree, is very moist, but when used in a violin it is very dry. The drying process is accomplished by shrinkage, which is unequal in the different directions of the grain, the result being that stresses are set up which interfere with the freedom of vibration of the fibers. For this reason wood must be dried very slowly and carefully, preferably in open sheds, over a period of several years. There is a premium on very old wood, and spruce beams from buildings erected a century or more ago are in special demand. Some makers contend, however, that proper seasoning for from five to seven years is ample, particularly if the wood is from old trees. Preliminary aging is necessary to allow the fibers slowly to adjust themselves to the shrunken dimensions of the block and to regain their freedom of vibration. The improvement in violins usually ascribed to age are more probably due to long usage and the consequent adjustments of the component parts to each other and the greater freedom of action of the cells through years of vibration.

For the sounding-board is required a block, 15 inches long and five inches wide, of clear, straight-grained spruce having between 18 and 22 evenly spaced "reeds" per inch. The piece must be split so that the two faces are along the medullary rays, and must be about two inches thick at one edge and not less than three-fourths inch at the other. These blocks are then sawn through the middle, leaving just enough wood uncut at one end to hold the two pieces together until they are seasoned and ready for use. Sometimes they are soaked in running water for a year, or treated with live steam, boric-acid solution, or dilute nitric acid, or subjected to electric current with the avowed purpose of freeing the cells of their "life pabulum" or otherwise working some won-

drous spell over the material. As one maker states it, "All methods but the natural one of long seasoning under cover, with air circulation, are alike in one important essential—they spoil the wood." Wood for the backs is handled in the same way, but in this case straightness of grain is avoided and waviness is essential. This is a matter, not of tonal quality, but of appearance.

The real work of the violin-maker begins with the truing of the thick edges of the two halves and gluing them firmly together. The outline is then drawn on the flat surface and followed by the scroll saw. Then begins the shaping of the outer surface, following some definite model, the chips and shavings becoming ever thinner and tinier as the oft-repeated application of the gauge warns of approach to perfection. With the outside of the table finished, then commences the slow, tedious hollowing out of the under surface until exactly the right thickness or graduations are obtained. To secure volume of tone, the sounding-board is made thickest at the part under the bridge, the center of vibration, and gradually thinned toward the edge to correspond to the diminution in force of the vibrations, in this way increasing the area of the sound-board that will respond to the action in the strings. Violins for orchestral purposes, however, are graded in the opposite way, concentrated action giving a tone that can be heard through a tempest of sound where a "volume" tone would be lost. The theories of grading are legion, and it is safe to say that every maker, even the veriest copyist, has evolved one of his own that he cherishes as a priceless secret. On this holy ground no layman dare tread.

When at last the thumb planes and the gouges and the sandpaper have done their work to the entire satisfaction of the sensitive thickening gauge, the *ff* holes are carefully located and cut. The tiny slanting notches locate the bridge. One who ought to know says that the bridge is not in its proper place (musically) unless it stands so that either foot is—not about, but exactly—three-sixteenths of an incl. from the nearest notch. Then there is the bass bar, a thin piece of carefully chosen spruce, 11 inches long and an inch deep in the middle, to be fashioned and snugly glued into very definite place. Finally, after long hours of loving toil—stolen, like as not, from some less fascinating, but more lucrative, employment—the sounding-board is pronounced completed and the back is modeled to mate it.

Building up the sides of the box is next in order, and in this work molds—inside, outside, or both together—are employed. The six ribs are bent over curved metal heated by a gas flame beneath, and when, after many trials and tests, they are of exactly the right shape they are fitted into the mold. Spruce blocks, glued in at the corners and ends, hold the parts firmly together. Next, the lining strips are added, and this part of the task is done. Later, with the back and sounding-board in place and the sound post meticulously adjusted, nought remains but the comparatively simple fitting of the neck, finger-board, and the tail-piece. One important step has been omitted—the varnishing, a task requiring Job-like patience.

[Continued on page 60]

Our Christmas Nuts

[Continued from page 10]

were the little red bullets. Now we have the great, thin-shelled, fine-flavored, named varieties that even yet are all too little known to people prejudiced against pecans from old experience. What it took the Old World thirty centuries to do with the Persian walnut the New World has done in thirty years with the pecan. About that length of time ago some men who were fond of mental exercise and thinking things out, after finding these superpecans growing wild in nature, were not content to eat, wonder, pass on, and forget, but took twigs from the trees, brought them home, grafted them on common pecan trees, and after a decent period of years ate nuts of the same kind growing on their dooryard trees. Then they set out orchards of these grafted trees and today are selling the nuts for a dollar a pound in northern markets. The dollar a pound is one reason why more people don't know about them.

The pecan, though one of the hickories, is at its very best only in the South. Yet it grows up into the Mississippi River States as far as above the middle of Iowa. All about southern Indiana are fine native pecans that almost rival the best of the southern nuts. Though exclusively a North American tree, as all the hickories were once supposed to be, until Meyer found one in China, it is native to the whole of but two states and parts of nine others, not extending west or far north of eastern Kansas, Oklahoma, and Texas, nor east or far north of western Kentucky and Mississippi. The area of the greatest planting of orchards of grafted pecans is in Alabama, Georgia, and Florida, where the pecan is not native. A serious study is being made to find a good pecan that will grow over a much wider area, extending it farther to the north, even to the North Atlantic States. There is a pecan tree ten feet in circumference in Hartford, Connecticut, that bears a few small nuts.

Can any one explain why such a nut is naturally confined to so small a part of the world? One might fancy that it was a late mutation of a more ancient hickory, springing into being high up on the Mississippi River and finding its way south by water, spread inland by the birds and squirrels.

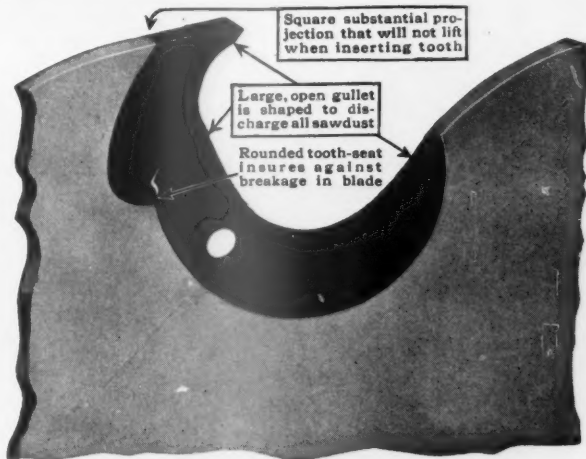
There are untold stories of other nuts that usually we do not find in the Christmas bowl, the chestnut and hickory nut, for instance, of beloved childhood memory. But that is another story.

The Gift De Luxe

Illustration shows size of these largest of the very finest pecans. Thin shells, easily opened: large luscious kernels, full of nutriment, easily removed whole. "Patrician Pecans are the finest nuts I ever saw," writes Dr. J. H. Kellogg, head of the famous Battle Creek Sanitarium.

Send me \$1.50 today and I will send you, postpaid, a beautiful 12 oz. Gift Box of Patrician Pecans, fresh from the orchard. GUARANTEE. Eat six at my risk; if dissatisfied return balance within ten days and get your \$1.50 back. 10 pound Family Carton, delivered, \$15.00.

ELAM G. HESS, Box 422, Manheim, Pa.



Patented April 13, 1920

Cuts faster with less power

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Lowers Operating Costs**

"THE fastest, easiest-running inserted tooth saw we ever had in our mills," is the way one big user describes the Disston Invincible Chisel Tooth Saw. "It stands more feed, takes less power, and always runs true."

The new design gives extra throat room. Specially shaped gullets carry *all* the sawdust out of the cut. None can become wedged in the gullet or be carried back into the cut.

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The bits are locked in place, to stay. The patented interlocking feature makes it impossible for them to start forward or run out of true.

You will want to know *all* about the many advantages of this faster, cooler, easier-running saw. Write us, "Send facts about your new Disston Invincible Saw," and mail your letter or card to Dept. B.

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IT HELPS



AROUND THE STATES

STATE FORESTERS VISIT PENN'S WOODS

State foresters from all sections of the United States met in Harrisburg on November 13 for their annual meeting. Following the session in Harrisburg, the foresters spent two days looking over various phases of Pennsylvania's state forests, including the State Forest School at Mont Alto. They also visited the plantation of the York Water Company at York, Pennsylvania. The progress of forest development in Pennsylvania was deeply impressed upon the men who made up these field parties. Mr. V. H. Sonderegger, State Forester of Louisiana, was elected the new president of the association, to serve during 1924, and it is expected that the association will hold next year's meeting in Louisiana.

MICHIGAN SPORTSMEN TO PROMOTE CONSERVATION PROGRAM

The Michigan Congress of Game Associations, numbering some five thousand members, who are the representatives of their particular localities throughout the state and who stand for the ideals of true conservation, have appointed a committee to investigate the efficiency of Michigan's forest fire protective organization. It is the purpose of the association to bring its influence to bear upon the taxpayers and other citizens and initiate a large and broad conservation program for the state. The congress recognizes that such a program must be based upon efficient forest fire protection, and it is desirous of seeing that every dollar spent by the state for this purpose will bring a dollar's worth of results.

The committee is investigating the fire protective organizations and systems of other states, with the idea of recommending the very best one possible to meet Michigan's forest fire conditions. Michigan today leads all other states in the amount of money available for forest fire protection, the legis-

lature having recently appropriated \$241,000 for that purpose. In addition, the state receives \$21,500 from the Federal Government for co-operative fire protective work.

NEW JERSEY'S PROGRAM FOR STATE FORESTS

New Jersey has just embarked upon a forestry movement that for her is new and of far-reaching importance. The Board of Conservation and Development, under which the forestry work of the state is administered, recently declared for a policy of large State Forest expansion. The plan proposed is the acquisition of not less than 20,000 acres of new State Forests each year for 10 years. It is intended to hurry this program as much as funds available will permit, so that the state may take over not less than 200,000 acres of its forest lands, or approximately 10 per cent of its forest area, as soon as may be.

There are now approximately 17,000 acres of State Forests in New Jersey, and these areas will be made the nuclei of large tracts, with entirely new locations for others of the purchases. An appropriation of \$100,000 is asked for from the 1924 legislature to initiate the program.

FOREST CROP IMPORTANT TO OHIO

That forest products are of great importance among the industries of southern Ohio is proved by an intensive forest survey of ten hilly counties completed within the year. The counties covered by the survey are Scioto, Pike, Lawrence, Adams, Vinton, Jackson, Ross, Athens, Hocking, and Gallia. Comparing the values of the forest products of these counties with the chief farm crops, the Experimental Station foresters find that the timber crop ranks above wheat and nearly equals corn in value.

The value of the year's timber crop was \$3,190,250, while the value of the entire corn crop was \$3,700,000. In making this comparison, foresters call attention to the fact

that these counties include the rich corn land of the Scioto Valley.

Last July the state came in possession of the John Bryan State Park, a gift of the late John Bryan. The tract contains 500 acres, 300 of which are wooded, the balance being available for planting or other purposes. This park is one of the finest scenic areas in southwestern Ohio.

The last General Assembly amended the state forest law, permitting the Forestry Department to acquire forest parks with intent to include areas of outstanding scenic value which are worthy of preservation and which should be made available for public use. The general appropriations for forestry in Ohio for the next biennium were increased 125 per cent over those for the last two years.

MINING COMPANIES IN PENNSYLVANIA PLANTING FOR THE FUTURE

Why purchase your timber from the South and the Pacific coast when you can grow it on your own lands? is the question the Pennsylvania Department of Forests and Waters is asking the mining companies of that state.

During the spring of 1923 mining companies in Pennsylvania planted more than 1,139,000 trees. Since 1916 they have planted 3,185,000 trees. This department furnished the trees free of charge. Reports show that these plantings are doing well. The fact that these companies continue to plant trees year after year indicates that they consider tree-planting a practical method of utilizing idle surface lands and the surest method of meeting the coming timber shortage, with its accompanying high prices.

Pitch pine, Scotch pine, red pine, larch, and white ash are among the best trees to plant for future mine use. They will grow on a variety of soils, are comparatively free from insect attacks and fungous diseases, and are rapid growers. The average height of plantations of these trees in Pennsylvania is 23 feet in 15 years

IDAHO SELLS SECOND CROP OF TIMBER

An interesting example of the importance of protecting unmerchantable timber at the time of cutting and holding it for a second cut is furnished by the State of Idaho when it recently sold timber on twelve forties of cut-over land for more than was realized from the first sale, fifteen years ago. The sale is all the more significant in view of the fact that more than two-thirds of the stand consists of tamarack, red fir, and white fir, species which in this section of Idaho are considered inferior. Only 5 per cent of the stand is western white pine, 29 per cent western yellow pine, and less than 1 per cent western red cedar.

The state sold nothing below 12 inches in diameter, and the purchaser enters into a contract with the state to protect all young growth from injury during logging operations; also to pile and burn all slash incident to cutting. Thus it is that the state is taking every precaution to insure a third cutting on this area.

The Florida Forestry Association will hold their annual meeting in Jacksonville early in March.

POLICIES OF CALIFORNIA'S NEW FORESTRY BOARD

A new State Board of Forestry has just been appointed by Friend W. Richardson, Governor of California, consisting of Fred A. Ellenwood, of Red Bluff, California; George H. Rhodes, of San Francisco, California; E. J. James, of Ukiah, California; Francis Cuttle, of Riverside, California, and M. B. Pratt, of Sacramento, California, State Forester.

The board has announced the following policies as its objectives:

Appropriation by the state legislature of sufficient funds for the prevention and suppression of forest, brush, grain, and pasture fires outside of the National Forests.

Acquirement of logged-off areas, both in the redwood and pine forests, as a nucleus for state forests for a future timber supply.

Enactment of state legislation necessary to enable the state to obtain title to all privately owned timber lands, cut-over lands, and brush-covered lands on watersheds, after the period has expired during which the owner of such lands has a right to redeem them under delinquent tax sales.

Adjustment of taxes on privately owned timber lands in such a manner as to encourage reproduction, perpetuate the timber supply, and preserve the watershed cover.

Maintenance and improvement of the present state parks for the use of the public for recreational purposes and the acquirement of additional desirable areas.

In adopting these policies the members of the board urged the co-operation of the people of the state in carrying them out.

FOREST PROTECTION GOING FORWARD IN TEXAS

The Governor of Texas has announced the appointment of a forestry committee of eleven citizens, comprising two Senators, two Representatives, and seven citizens from the state at large. The committee is instructed to submit a report to the next legislature on the Texas forestry situation and to submit recommendations as to additional legislation necessary to develop a practical forestry policy. Governor Neff is to be congratulated in selecting, for service on the committee, legislators and citizens who in the past have rendered distinguished service in behalf of forestry progress.

The increased appropriation made available by Texas for state forestry work has made possible additional development along a number of lines. The number of patrolmen engaged in forest fire prevention and suppression work, in co-operation with the Federal Government and the landowners, was increased from 23 to 31. These men serve approximately seven months during the year. During 1921 11½ per cent of the gross area under patrol was burned over, but during the year 1922 only 5¼ per cent of this area was burned over, while from present indications it is hoped that during 1923 the burned acreage will be reduced to between 3 and 4 per cent. It is estimated that the fire prevention and suppression work has been responsible for renewing young forest growth upon approximately 500,000 acres during the past five years. To actually reforest such an area by hand-planted trees or hand-planted seed would cost in the neighborhood of \$5,000,000.

ALL LOUISIANA SCHOOLS TO TEACH FORESTRY

T. H. Harris, Superintendent of the State Department of Education, has requested that the Forestry Division of Louisiana furnish forestry books, to be used in the schools throughout the state for educational purposes. Mr. Harris, in a recent letter, said that forestry must be made a part of the public-school education. He is, therefore, arranging his schedule for the spring, whereby all public schools of the State of Louisiana will teach forestry as part of their work. The following committee has been appointed to assist in developing the proper material for forestry education: State Forester V. H. Sonderegger, Major J. G. Lee, member of Forestry Advisory Board, and Messrs. W. E. Shell and E. S. Moncrief, two former school teachers.

The Louisiana law, known as section 14 of act 90 of 1922, provides "that the state and parish boards of public education are directed to provide for proper courses of instruction by textbooks or lectures on the general subject of forestry in all the public schools of this state."

The Forest Inspector of the Division of Forestry is now busily engaged in the examination of cut-over lands to be placed under contract for reforestation purposes, in accordance with the law known as the Louisiana Forestry Act. At present 166,000 acres are under contract, representing about 1 per cent of the total wooded area of the state.



UNIVERSITY OF CALIFORNIA FORESTRY STUDENTS ADOPT FAWN AS MASCOT

Forestry students while cruising timber near the University of California summer forestry camp in Plumas County, California, found an injured fawn. Taking it to camp, they dressed its wounds; whereupon the young animal lost much of its native shyness and became quite friendly. The picture shows a group of students outside their mess tent feeding the fawn from a nursing bottle.

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MORE MONEY ASKED FOR VIRGINIA FORESTS

The State Forester of Virginia has recently submitted to the Governor, in advance of the preparation of the Governor's budget, an estimate of the funds imperatively needed by the State Forestry Department for the two years beginning the first of next March. For next year the total amount needed for all forestry work, providing for a skeleton fire protection system in 62 counties, is estimated to be \$75,950, nearly half of which is expected to come from federal, county, and private fire protection funds passing through the state treasury, leaving \$39,284 as the budget estimate for the State Forestry Department. For the second year fire protection systems are planned for 78 counties, with a total expenditure of \$85,587, and the state's share is estimated to be \$42,827. These figures are for the consideration of the Governor in transmitting his budget to the legislature. The present appropriation is only \$18,000 per year.

BOYS' FOREST CLUBS ACTIVE IN LOUISIANA

Approximately 600 members have been enlisted in the boys' reforestation clubs of Louisiana and all have their individual plots. These boys are all engaged in getting their plots in first-class shape for January 1, when the judging will take place. \$850 in

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cash prizes will be distributed to the boys who have been thrifty and made good. The greater portion of this money has been donated by the lumber industry of Louisiana.

NORTH CAROLINA SEEKING TO CONVERT THE "LIGHT-BURNERS"

F. B. Merrill, district warden of the forestry division of the North Carolina Geological and Economic Survey, has been successfully engaged in evangelistic work against the wasteful practice of "light burning" in the famous "sandhill" section of the state, now noted for its health resorts and orchards, but once thickly forested with long-leaf pine. Evidence adduced shows that even light winter fires at periods of from one to three years are sufficient practically to prevent all reproduction of this extremely valuable tree. Investigation of effects of fires in stands above the seedling stage are to be made during the next year by the Appalachian Forest Experiment Station. Millions of young long-leaf pines from the seed year of 1921 have been found wherever there has been protection from fires.

Illustrative of the growing interest of owners of commercial timber tracts in forest preservation and reforestation is the experiment of the Champion Fiber Company of Canton in establishing a nursery for experimental planting, in whose flourishing beds are 500,000 seedlings of white pine, Norway spruce, yellow poplar, Japanese larch, etc. Several of these species have been successfully planted on the cut and burned scar of Mount Mitchell, the highest peak east of the Rockies, the summit of which is embraced in North Carolina's one state park.

BOYS' FORESTRY CLUBS IN COLORADO

Mr. W. O. Sauder, agricultural agent, Saguache County, Colorado, is responsible for the inauguration of the boys' forestry club idea, which is becoming popular in many localities of Colorado and which should mean much, at least, to the development of farm forestry.

Beginning with the first club, organized last year at Crestone, Colorado, the idea has spread rapidly, becoming popular with girls as well as boys and arousing much comment because of the excellence and unique character of the work.

Mr. Sauder, after a conference with State Forester Morrill, organized the club May 3, 1922, with ten boys as members. The local forest ranger was selected as club leader, and on May 13, 1922, the village of Crestone appropriated a small fund for getting trees planted within its corporate limits. The actual planting of twelve trees was done by a few men and the members of this little club, the latter being pledged to care for them.

The scope planned for these clubs is the study of tree identification, stream-flow protection, fire protection, timber estimation,

size and age to cut, and the varieties used for different purposes in lumbering operations.

During last summer several trips were made into the woods near Crestone and the boys were instructed in the identification of trees and shrubs.

STEEL LOOKOUT TOWERS USED IN CANADIAN FOREST RESERVES

Two 80-foot steel lookout towers have been recently erected on the Pinos and Pasquia Forest Reserves in Canada. In low-lying country such towers are the only means the rangers have of detecting fires at any distance, and it is planned to have enough of them in each ranger district so as to enable the ranger to reach a tower and take an observation at least twice each day in the course of his patrol.



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BOOK REVIEWS

THE AMERICAN LUMBER INDUSTRY. By Nelson Courtlandt Brown. Wiley (New York). Price, \$3.00.

Designed to serve as a textbook in forest schools as well as a practical aid for those engaged in the lumber industry, and as a source of reference for the general public interested in the lumber industry—its economics, statistics, and merchandising methods—"The American Lumber Industry" is written from the standpoint of the timber owner, manufacturer, wholesaler, and retailer, and therefore covers the chief features of these great branches of the industry.

Because it is such a broad subject, the need for brevity impelled the author to touch more lightly upon those phases which have been dealt with extensively elsewhere, such as logging, manufacture, preservation, and seasoning, stressing those phases which have not heretofore been expanded upon. A result of fifteen years' close study by a leading authority, the entire field is completely and comprehensively covered from the practical working side, including manufacturing, wholesaling, exporting, and technical phases of the subject. The book will fill a long-felt want for a compact volume dealing with all phases of the lumber industry in America.

THEORETICAL AND APPLIED COLLOID CHEMISTRY. By Dr. Wolfgang Ostwald and Dr. Martin H. Fischer. Wiley (New York). Price, \$2.50.

This is the second and enlarged American edition, comprising five lectures by the author, who is a professor in the University of Leipzig. In his introduction, the author calls his book a *propaganda sheet for colloid chemistry*, stating that while practically every scientifically cultured individual knows something about radio-chemistry, its twin-science, colloid chemistry, the fruits of which are no less wonderful and in many applications surpass those of radio-chemistry, still seems largely unknown to the general public.

FIRE LOSSES—LOCOMOTIVE SPARKS. By L. W. Wallace. Barr-Erhardt Press (New York). Price, \$3.00.

This volume sets forth the findings of some five years of intensive investigation by the author, of locomotive sparks and their relation to fires occurring along the right of way of American railways. A builder of locomotives, the author concentrated on the study of the problem of preventing fire-carrying sparks, and in conducting his investigations every known question that had arisen in connection with lawsuits for dam-

ages from fires alleged to have been started by locomotive sparks was covered. The book is replete with valuable information pertaining to locomotive construction, maintenance, and operation and the multitudinous factors entering into spark-control.

THE PRINCIPLES OF INSECT CONTROL. By Wardle and Buckle. Manchester, University Press. Price, \$6.00.

Covering the whole field of insect control as thoroughly as possible under one compilation, this book gives valuable information concerning the chemical nature of insecticides as well as locust control, host immunity, status of birds, fumigation dosages, the comparative merits of dusting and spraying, and many other modern aspects of insect control never before presented in one volume. It will undoubtedly be of great value, as the greatly increased production and distribution of foodstuffs has brought about a corresponding increase in the range of injurious insect pests, and an adequate recognition of economic entomology and the scientific application of insect-control measures has become increasingly important.

"SCOTT BURTON, LOGGER," and "SCOTT BURTON AND THE TIMBER THIEVES." By E. G. Cheney. D. Appleton & Company (New York). Price (each) \$1.75.

In these two books the author, a well-known forester, has presented two gripping tales for boys. The stories are replete with action and exciting situations, in which Scott Burton, a young forester, always emerges triumphantly. The scene of the first story is laid in New England, where the hero comes into possession of a large tract of timber lands and finds problems a-plenty awaiting him when he undertakes to lumber it. The second story is laid in the swamps of Florida, where Scott Burton is sent by the Forest Service to ferret out a gang of unusually clever timber thieves.

Making of a Violin

(Continued from page 54)

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POSITIONS WANTED

WANTED POSITION by a forester, age 39—ex-captain A. E. F. Infantry—understands forest management, forest protection, practical lumbering and logging experience. Desire employment by estate or forest production company. If you are in need of a practical, hard-working man, address Box 5070, care of AMERICAN FORESTRY MAGAZINE, Washington, D. C. (11-2-24)

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RICHARD T. FISHER
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From My Indian Diary

By CARROLL V. SWEET

(Continued from page 16)

by my friend, the conservator, as we sat drinking a late tea before starting for camp, was almost as good as the real thing, for my host had had years of experience with elephants and had the reputation of knowing more about them than any other man in the Indian Service. Instead of witnessing one tussle, I got the thrills of many—when things went right and when things went wrong.

The elephants have to be diligently watched every minute of the day and night, until suitable tame elephants can be rounded up from the surrounding country and brought to the stockade. Then the real fun begins. The most troublesome one of the herd in the stockade is singled out to be made an example of, and a reliable elephant and mahout enter the arena and bear down upon him with full force. Bullfights are illegal, even in Asia, but this is all part of the day's work. The unruly one is pushed, squeezed, beaten, goaded, gored, and generally humiliated by his tame cousin, who delights in his rôle and shows great intelligence and initiative in its pursuit. If one trained elephant is not enough to humble the wild one, another is sent in to help. When the wild spirit is broken, a truce is called, and the same medicine is administered to each of the others in turn, until they all are fairly quiet and accustomed to the presence and behavior of their civilized relatives.

They are then considered to be in the proper mood to be taken out of the stockade. Each wild one is chained between two tame ones and led out into the jungle to the sales depot. In this case it was necessary to guide the trio of lumbering beasts down a mountain trail so narrow, rocky, and precipitous that a man on foot would have difficulty in negotiating it.

After about two weeks in captivity the elephants are sold, and then the real training begins. In six months' time the ordinary elephant is quite workable, and at the end of a year's time he is considered thoroughly tamed for ordinary work. If he has a nasty disposition, he may bolt at some critical moment, even after years of training, in which case neither the mahout's steel cudgel nor anything else short of a bullet from a 500 cordite under the corner of his jaw can stop his rampage.

EDITOR'S NOTE.—This is the first of a series of personal experiences written by American foresters whose employment by foreign governments has taken them into remote and interesting lands.

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For further particulars address

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Write for announcement giving full information.



The grading and sorting table at one of the fifteen Weyerhaeuser manufacturing units. Here the lumber is graded, regraded, checked, inspected and sorted by men with years of experience and training. Weyerhaeuser thoroughness makes for uniformity in grades.



This alley in the storage and drying yard of one of the Weyerhaeuser mills gives an idea of the immense quantities of lumber accumulated by this organization to take care of the needs of its customers. The higher grades are protected in storage sheds.

The Importance to Industry of Uniformity in Its Lumber Supply

THE industrial concern, hampered in one or more of its operations by a lack of uniformity in its lumber supply, will find it worth while to inquire into the service the Weyerhaeuser organization is rendering to a wide variety of industrials.

This service insures a constant supply of lumber, uniform in grade, car after car. The tenth or hundredth car is like the first. The first car in the type of wood and in the particular grade best fitted to meet the requirements of the buyer.

Such a service reduces operating costs in many ways. Production is not hampered through lack of the right kind of lumber. There is no unnecessary wastage of lumber. Handling costs are reduced.

In short, the user is able definitely to standardize lumber practices and factory operations.

THE Weyerhaeuser organization has for years studied industrial lumber needs. It has found that the best way to serve American Industry is to help a group of permanent customers find the wood best adapted to their requirements; and then to keep them supplied with the exact type of lumber in the correct grade, size and quantities they require.

Such a lumber service is made possible because of the timber resources, specialized

equipment and highly-trained personnel of the Weyerhaeuser organization:

A large supply of mature timber of fifteen different species, and many types within these species, sufficient for decades of cutting.

Scores of logging camps guaranteeing a steady stream of suitable raw material.

Fifteen complete modern manufacturing units.

Seasoning processes that prepare lumber scientifically for each exacting need.

A crew of men at all the plants, with years of experience in producing, grading and shipping Weyerhaeuser quality lumber.

A corps of salesmen trained to think as purchasing agents and buyers have wished for lumber sellers to think.

Distributing facilities backed by fifteen immense mill stocks and two great strategically located storage plants.

EACH year more and more concerns are finding what this type of lumber service means in standardizing their lumber practices and factory operations.

The Weyerhaeuser Sales Company distributes Weyerhaeuser Forest Products through the established trade channels. Its principal office is in Spokane, Washington, with branch offices at 208 So. La Salle St., Chicago; 220 Broadway, New York; Lexington Bldg., Baltimore; and 4th and Robert Sts., St. Paul; and with representatives throughout the country.



WEYERHAEUSER FOREST PRODUCTS SAINT PAUL • MINNESOTA

Producers for industry of pattern and flask lumber, factory grades for remanufacturing, lumber for boxing and crating, structural timbers for industrial building. And each of these items in the species and type of wood best suited for the purpose.



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Lumbermen and others desiring instruction in special subjects may be enrolled as

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For further information and catalogue address: The Dean of the School of Forestry, New Haven, Connecticut, U. S. A.

The New York State College of Forestry Syracuse University Syracuse, N. Y.

A FOUR-YEAR course in Pulp and Paper Manufacture and a short course each spring in Dry-kiln Engineering and Lumber Grading are regularly given. The State Forest Experiment Station of ninety acres at Syracuse, three other experiment stations, the Roosevelt Wild Life Forest Experiment Station, a modern pulp mill, a well-equipped sawmill, a complete dry-kiln plant, the biological laboratories, and an excellent reference library afford unusual opportunities for investigative work. In addition to the regular four-year undergraduate courses, special courses are offered that lead to the degrees of Master of Forestry, Master of City Forestry, Master of Science, Doctor of Philosophy, and Doctor of Economics.

FRANKLIN MOON, Dean

WOMAN'S CIVIC CLUB PLANTS MEMORIAL TREE

An American white elm and a bronze tablet, bearing the names of eleven heroes of the World War, mounted on a concrete base, today stand in Clarendon, Virginia, mute wit-

Using the same trowel that was used by Mrs. Harding when she planted the memorial elms for the American Forestry Association at the entrance to International Avenue, at



THE TREE MARKER AND SMALL PARTICIPANTS IN THE CEREMONY OF ITS DEDICATION

nesses to Arlington County's life contribution to the cause of humanity. The tree and marker were dedicated by the Woman's Civic Club of Arlington County, on Armistice Day, with an impressive ceremony which attracted hundreds of people to the little triangle on Wilson Boulevard which was given for the purpose—deeded in perpetuity—by Ashton C. Jones. Brigadier General Charles H. Martin delivered the principal address at the dedication.

the Lincoln Memorial, in 1921, little Miss Kathryn Bruce, daughter of Corporal Robert J. Bruce, who was killed in action in Russia, placed the first bit of soil around the roots of the tree. She also unveiled the memorial tablet. Appropriate recitations by Miss Mary Fitch and fifteen little girls were impressive parts of the program.

Frank M. Sherwood, commander of Arlington Post, American Legion, was master of ceremonies and Mrs. S. B. Detwiler had charge of all arrangements.

THE JOY OF PLANTING TREES

By G. A. Whipple

Trees are the most valuable and dependable friends to humanity in the whole out-of-door world, especially to girls and boys. If the future citizens of this country are to carry the torch of patriotism passed to them by the founders of the nation, they must absorb the liberalizing influences of the forests, the tolerance and self-reliance trees teach, the strength and character they impart. For these reasons the boys and girls of today should grow up to love trees; to protect, plant, and preserve trees.

Before one can appreciate the value of these living noble giants of plant life, one must go where trees grow; see them, feel them, enjoy their shade and protection, and understand something of the great part they play in nature's scheme of life, and the mental, spiritual, physical, as well as the commercial, benefits they afford.

The best way to begin gaining this knowledge is to plant trees. There is great interest for the planter in the tree he has planted. There is remarkable satisfaction in seeing

a baby tree develop from a seedling into a mighty body, with staunch limbs and a lofty, leafy, swaying top, particularly for the person who placed its hungry roots in contact with Mother Earth, so the miracle of growth might take place.

Children and adults who plant trees will always take pride in the accomplishment. In after years they can point to the full-grown tree and say with rare exultation, "I planted that tree." They will naturally desire to protect such trees, as part of their handiwork. They will be glad to return to the spot where the trees were started on their century of life, for the purpose of observing the progress the trees have made.

They will look upon those trees as companions along the road of experience. Perchance they will have the privilege of walking in the shadowed coolness of the mature trees, in catching the scent of the woody perfume, and in beholding the beauty of color and conformation materialized through the years.

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The Lenox Building, 1523 L Street N. W.

WASHINGTON, D. C.

1875

1925

IN 1925 The American Forestry Association will celebrate the fiftieth anniversary of its founding. During these years it has grown from an idea to an influential organization of over 14,000 members—people whose love of country has aroused them to the menace of our vanishing forests. With members in every state in the Union and in 29 foreign countries, The American Forestry Association occupies today a position of power and leadership in the cause of forest conservation. For half a century the Association has met all opposition, surviving one crisis after another, when a cause less vital and worthy would have failed.

In order to commemorate this outstanding record of service, an effort will be made during 1924 to

DOUBLE OUR MEMBERSHIP

This could be accomplished with comparative ease by general magazine subscription methods. Such methods, however, fail to yield the loyal type of membership for which the Association has always striven. We have accordingly decided to double our membership by asking that

EACH MEMBER GET ONE NEW MEMBER

or send us the names of twenty-five people whom they believe to be interested in the conservation and perpetuation of

American Forests and Forest Life

It will take but a few minutes, and will yield splendid returns for the time and effort invested.

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